

FIG. 1

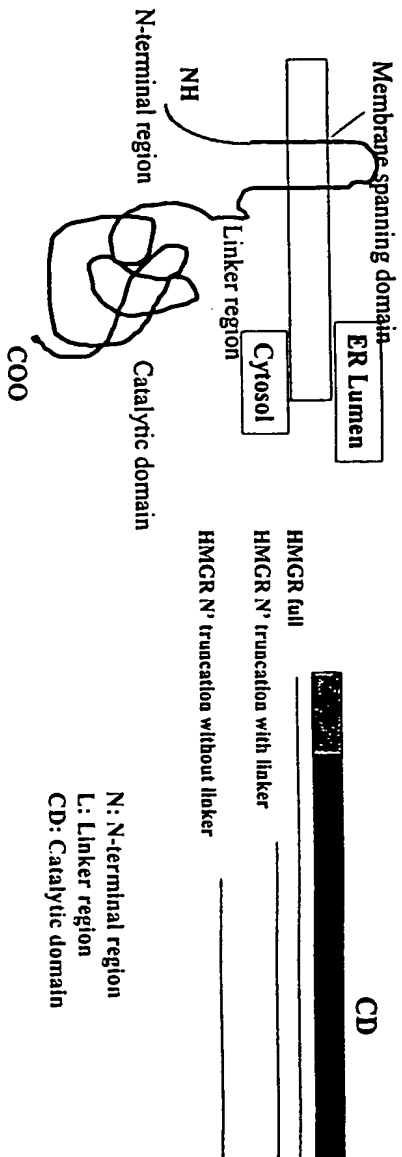


FIG. 2

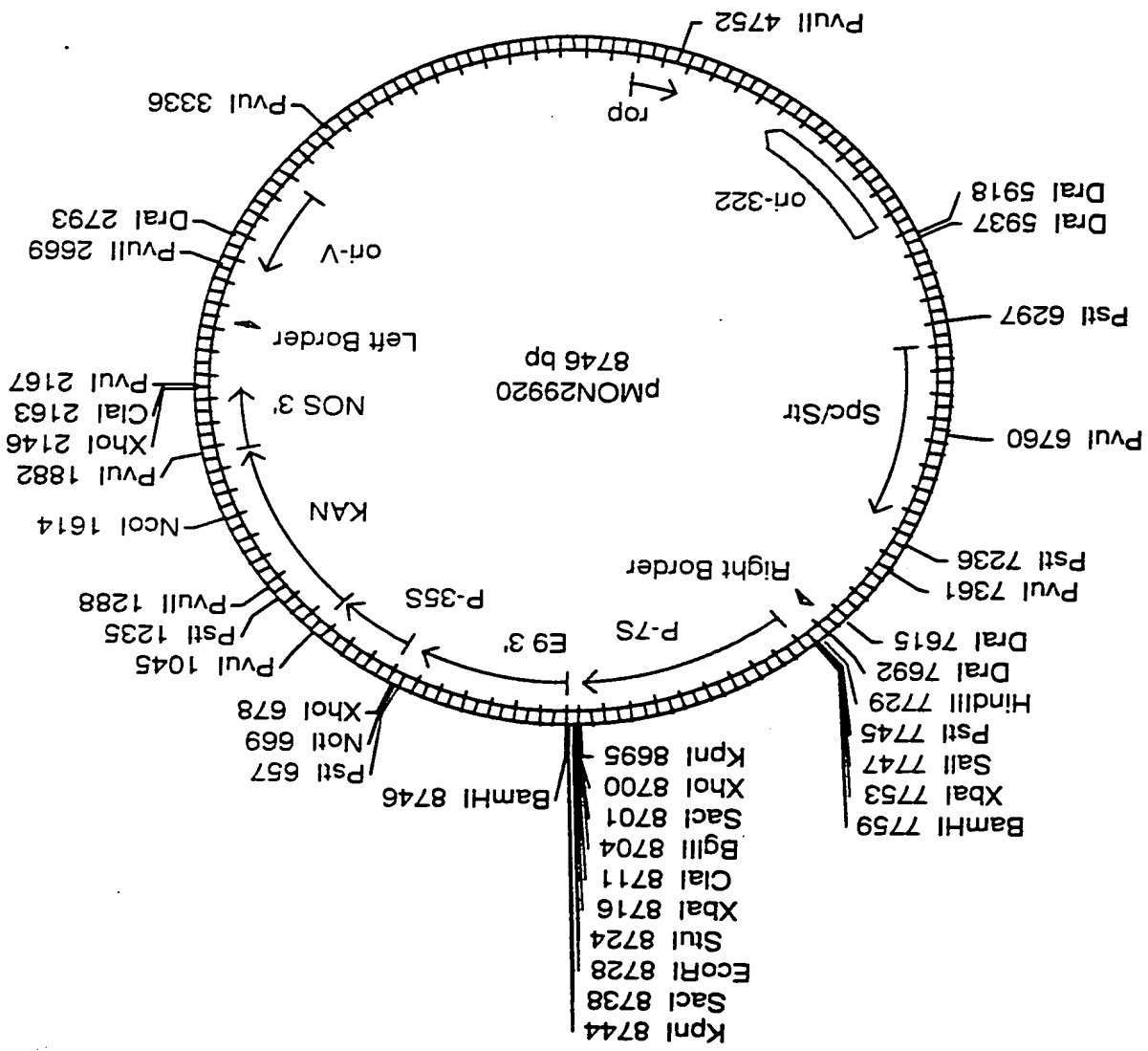


Figure 3: Construct pMON29920

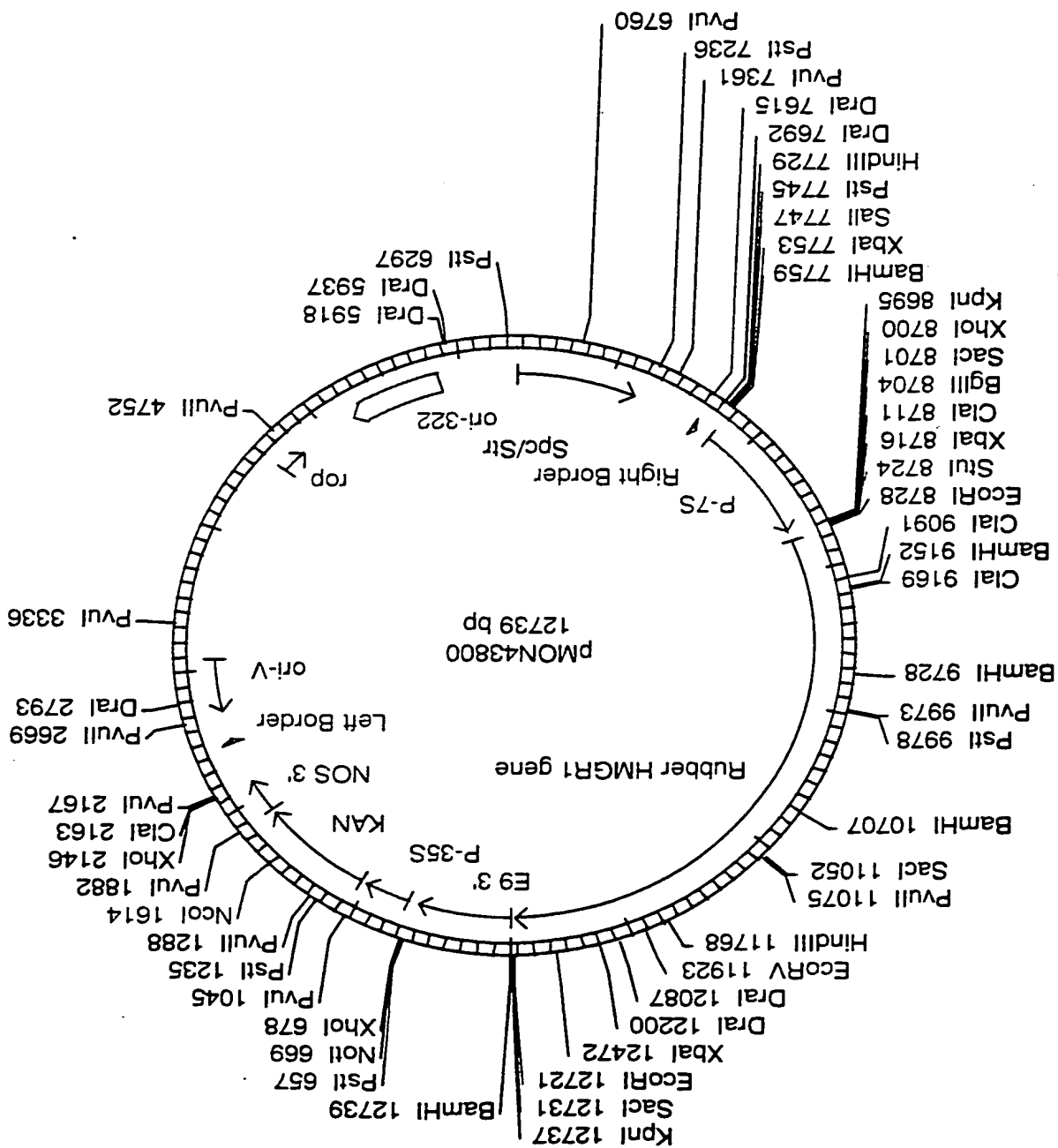


Figure 4: Construct pMON43800

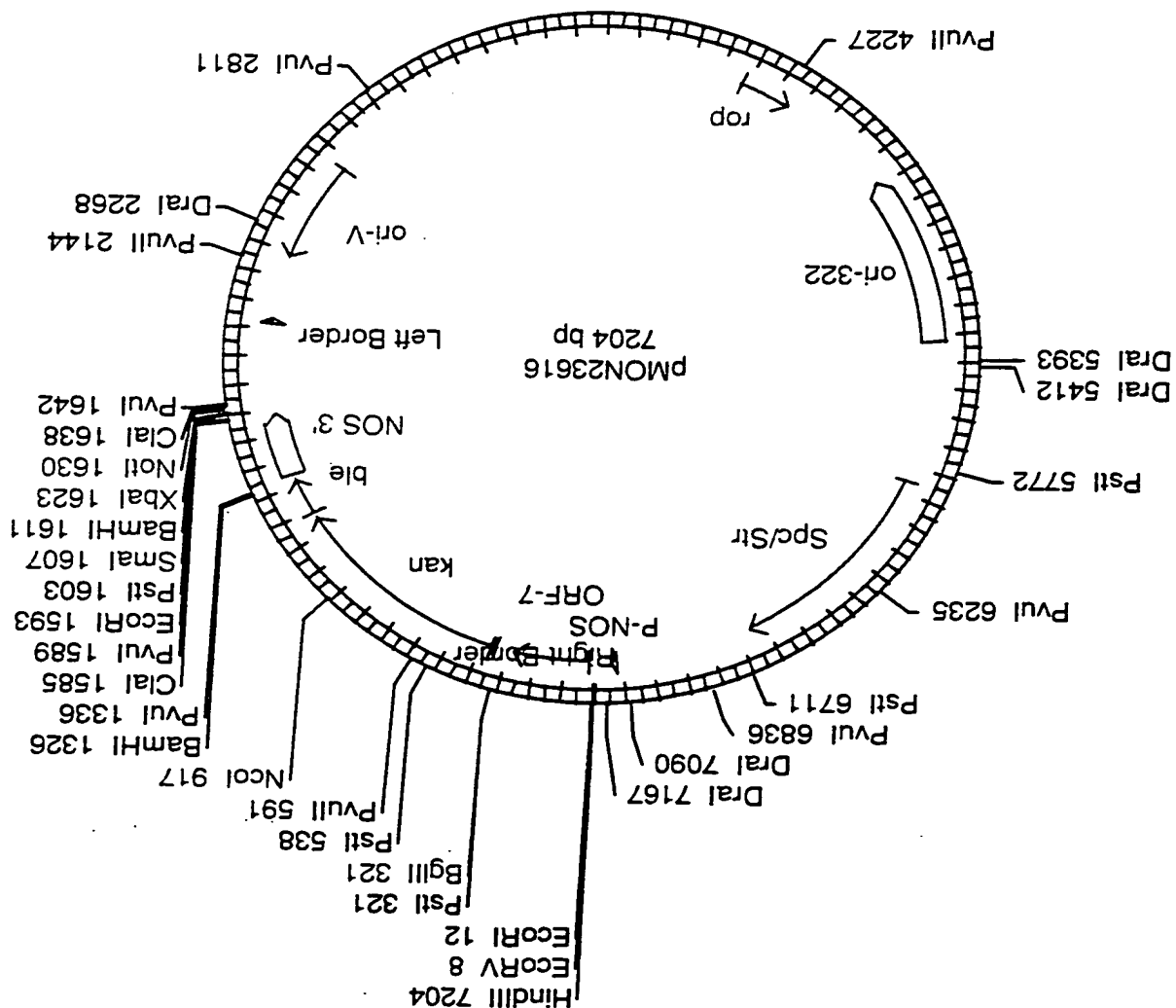


Figure 5: Construct pMON23616

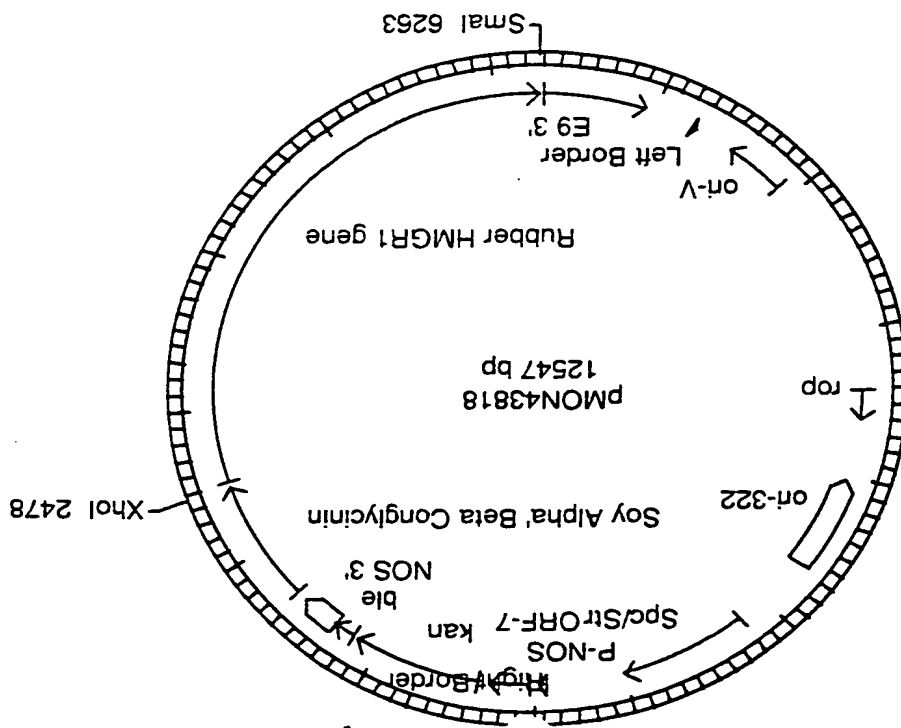


Figure 6: Construct PMON43818

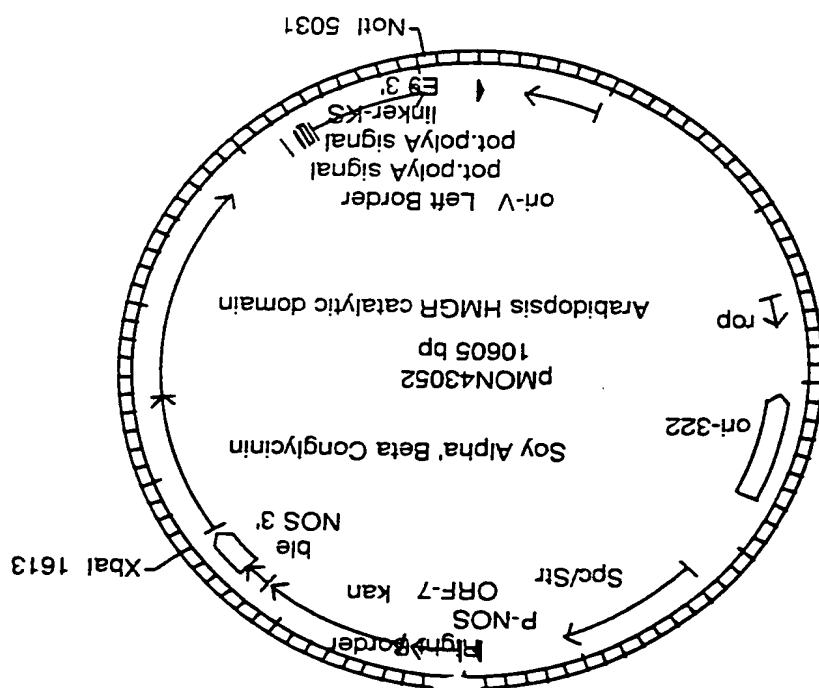


Figure 7: Construct pMON43052

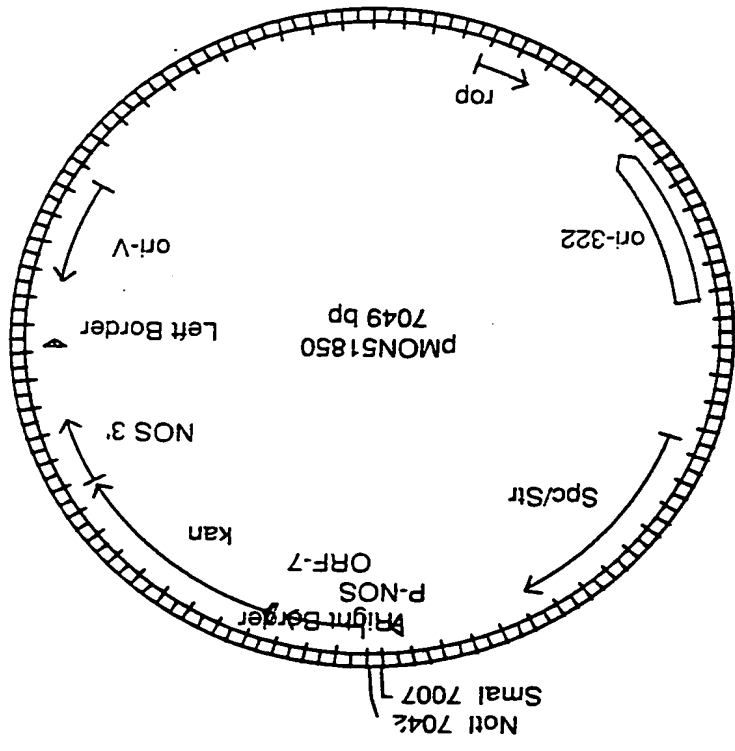


Figure 8: Construct pMON51850

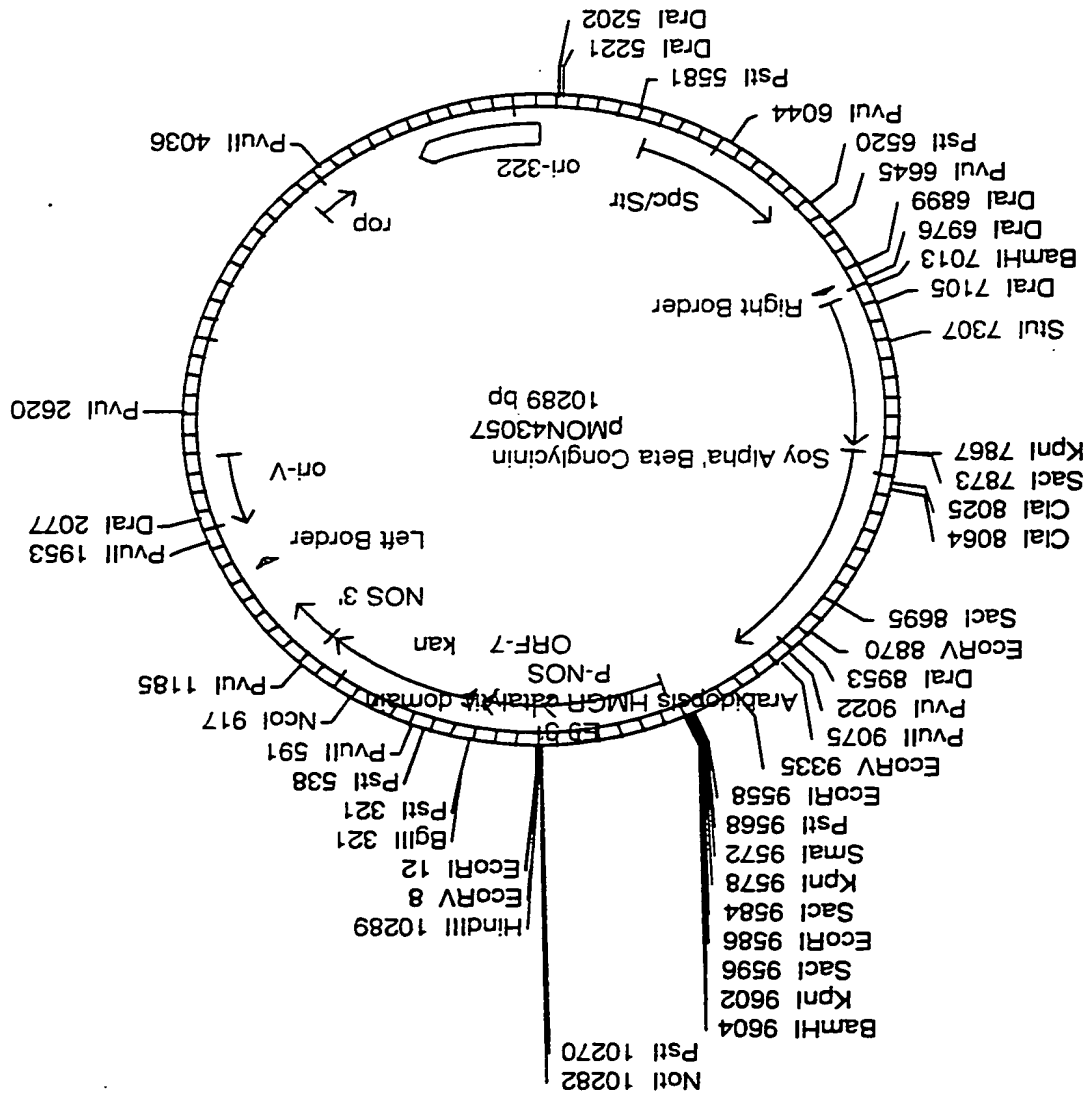


Figure 9: Construct pMON43057

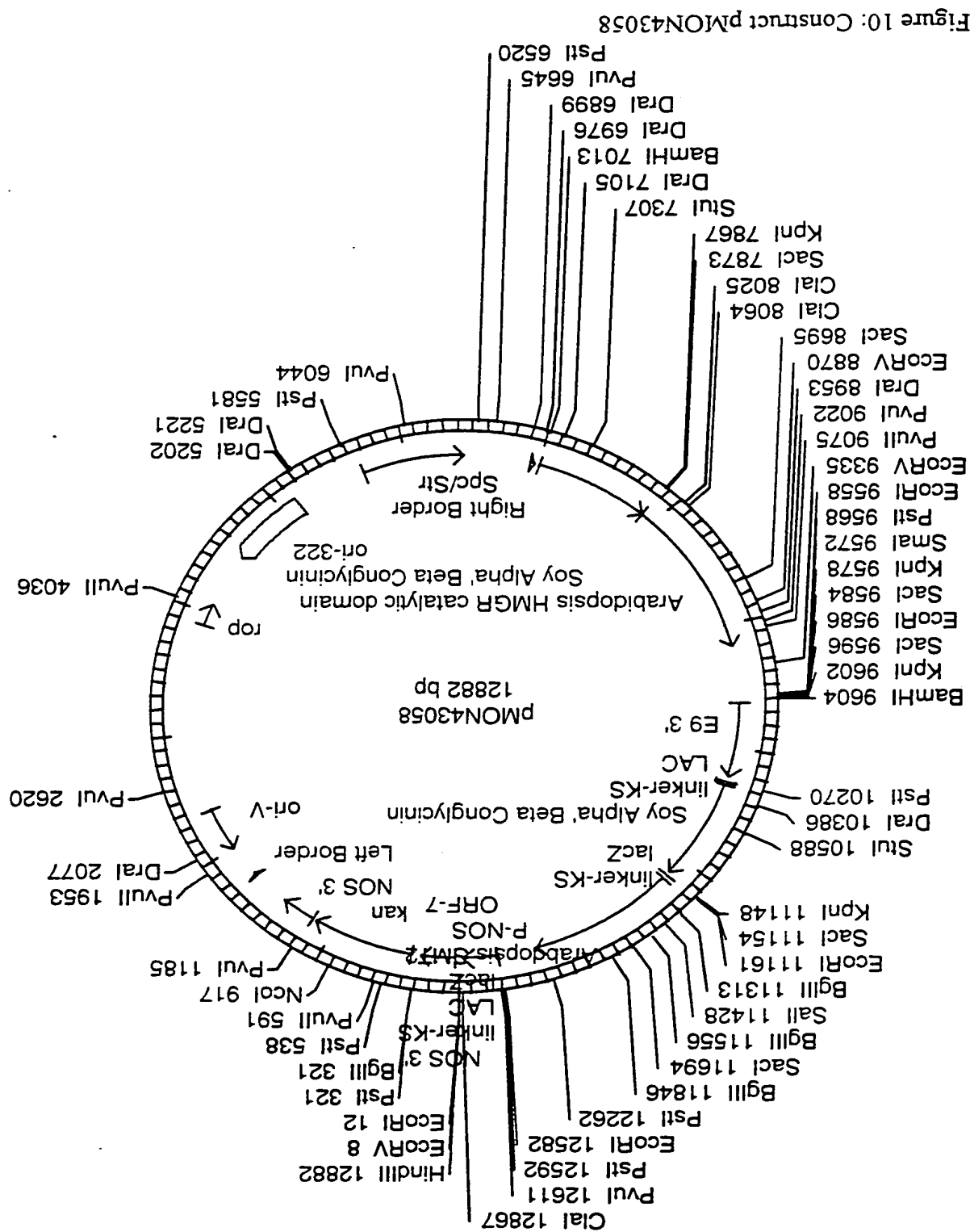


Figure 10: Construct pMON43058

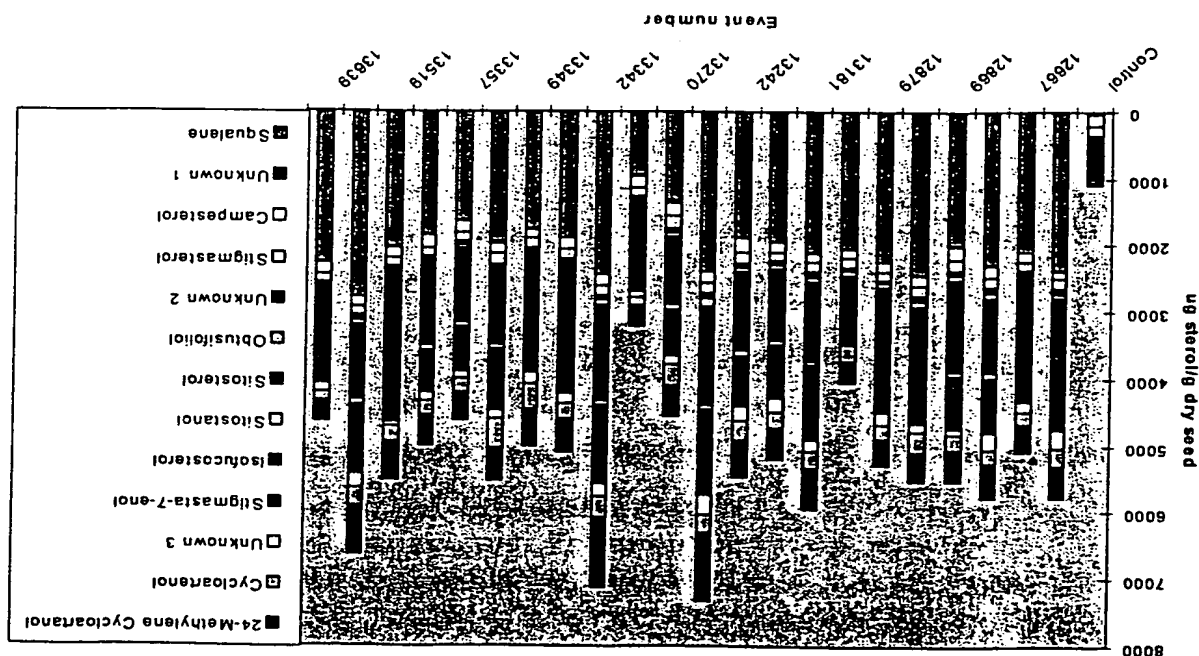


Figure 11: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) was overexpressed using seed-specific 7S promoter (data from PMON43057: pTss::4x HMGR truncated).

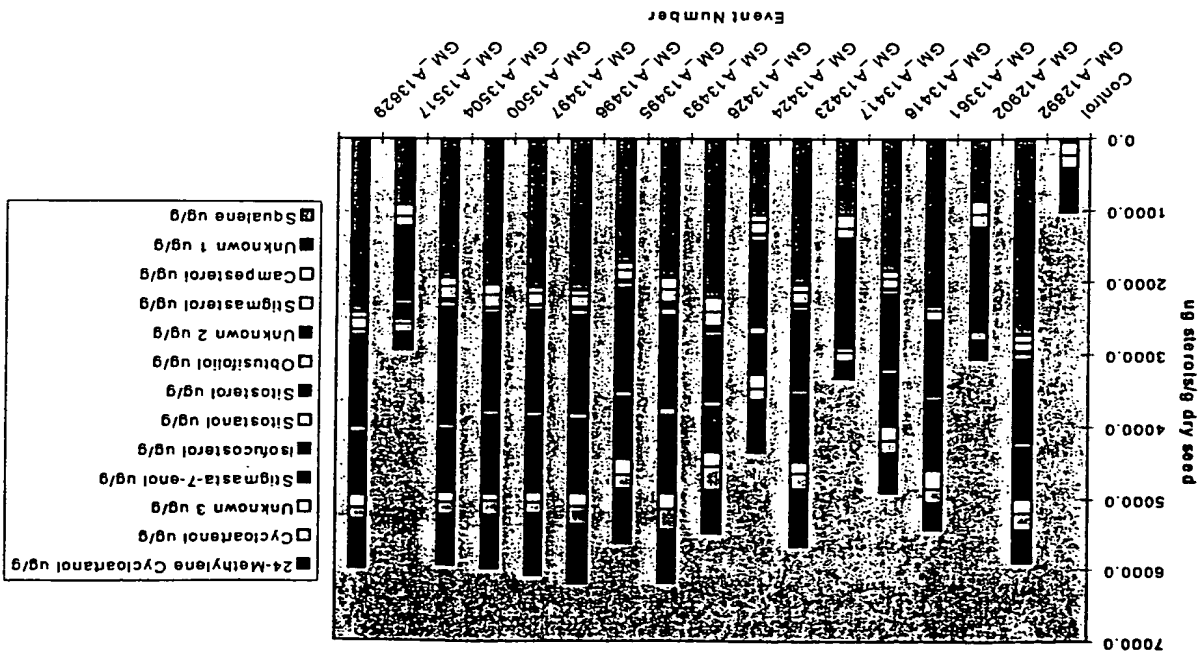
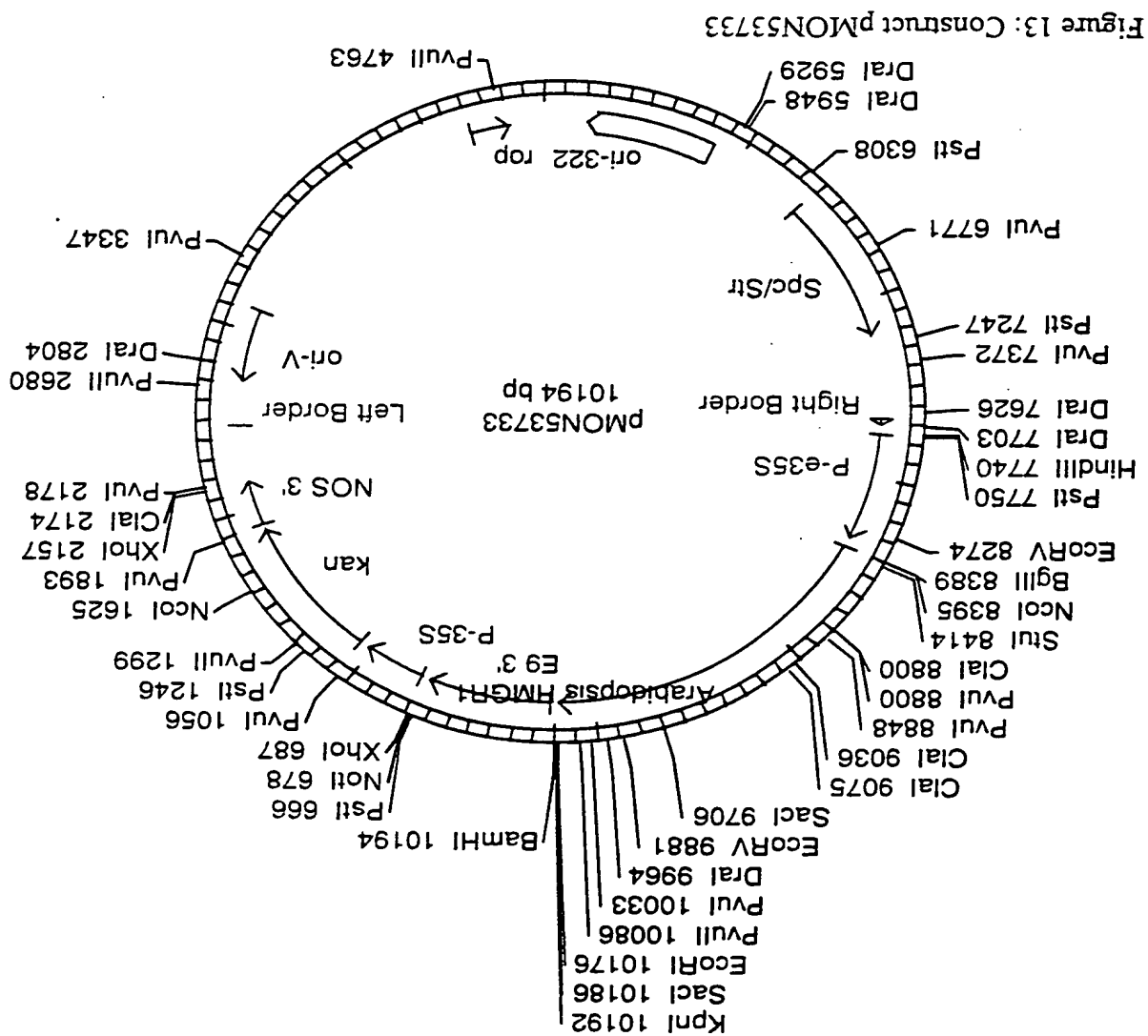


Figure 12: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) and *Arabidopsis* SMTII were overexpressed (data from pMON43058: pTS::4r HMGR truncated & pTS::4r SMTII). The expression of the genes is controlled by the seed-specific 7S promoter.



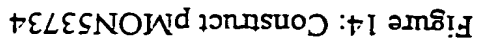


Figure 14: Construct pMON53734

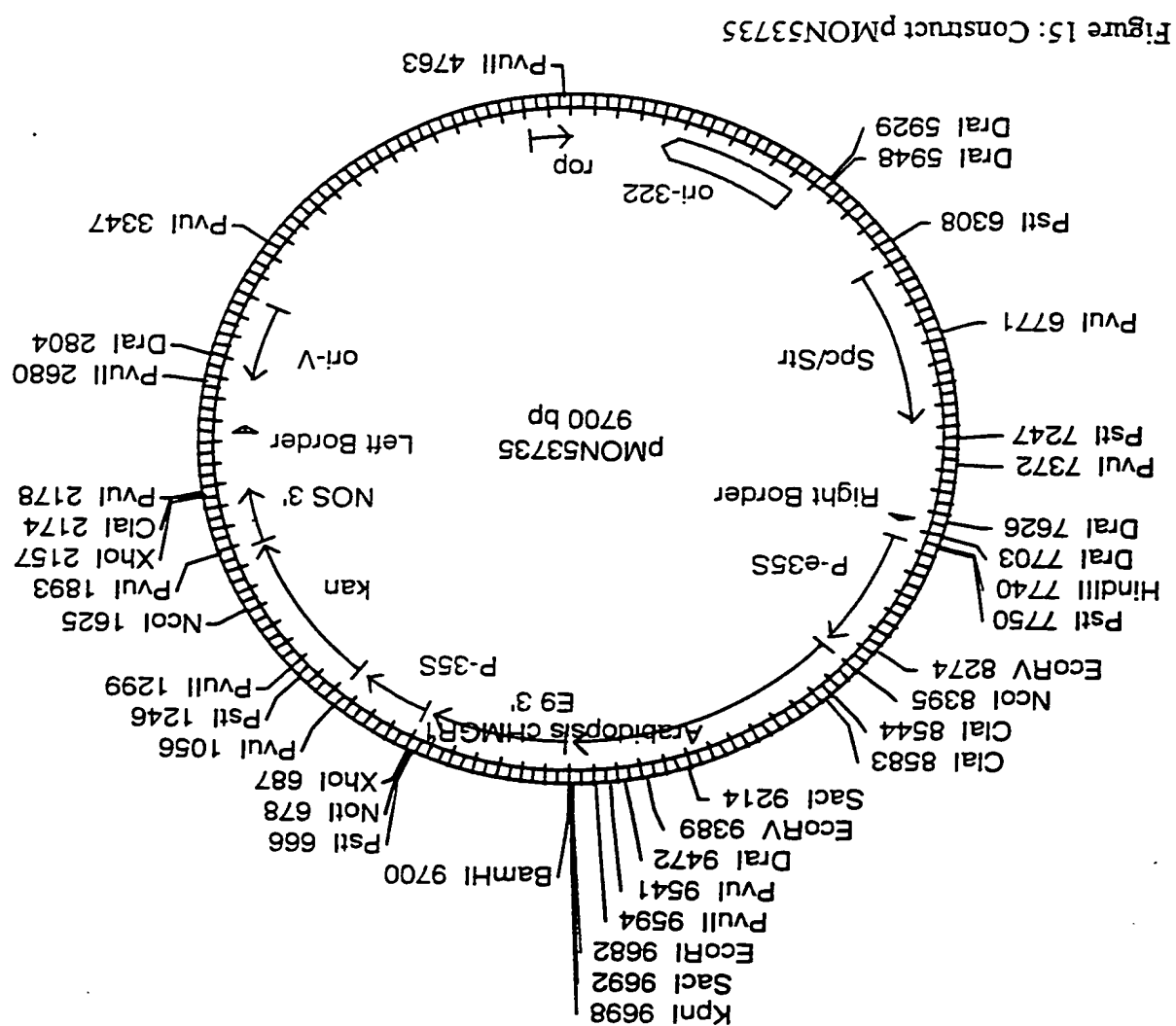
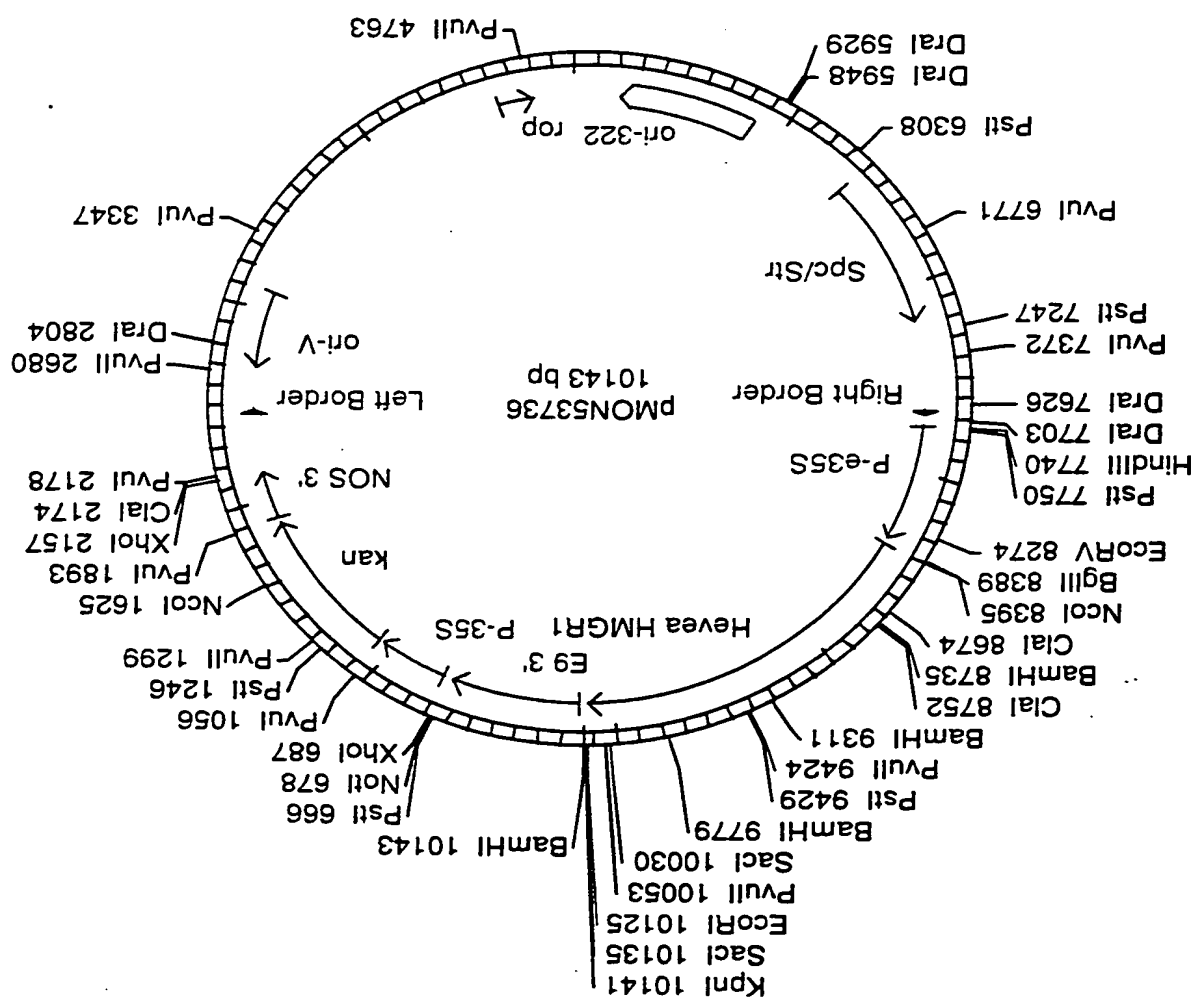


Figure 16: Construct pMON53736



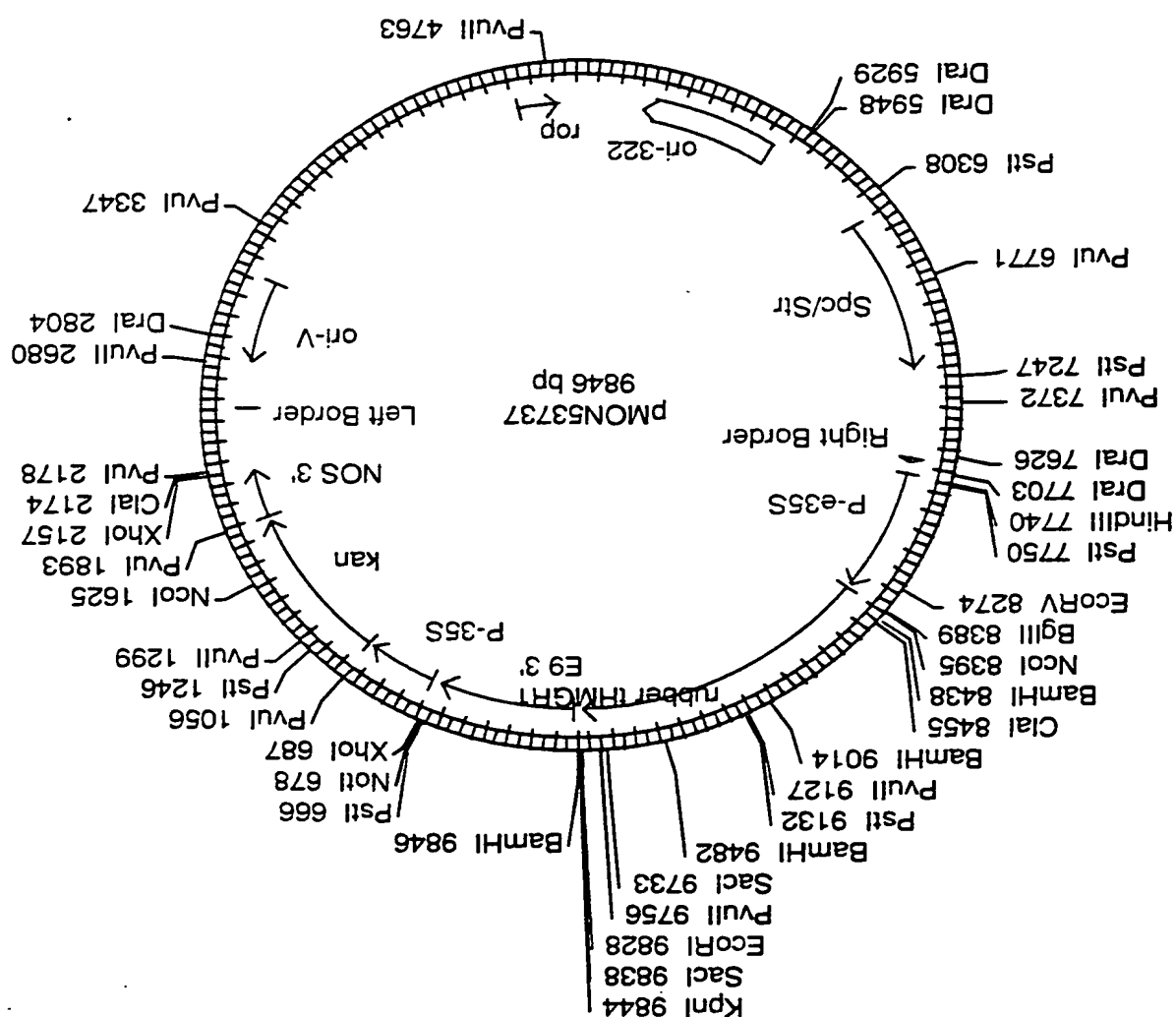


Figure 17: Construct pMON53737

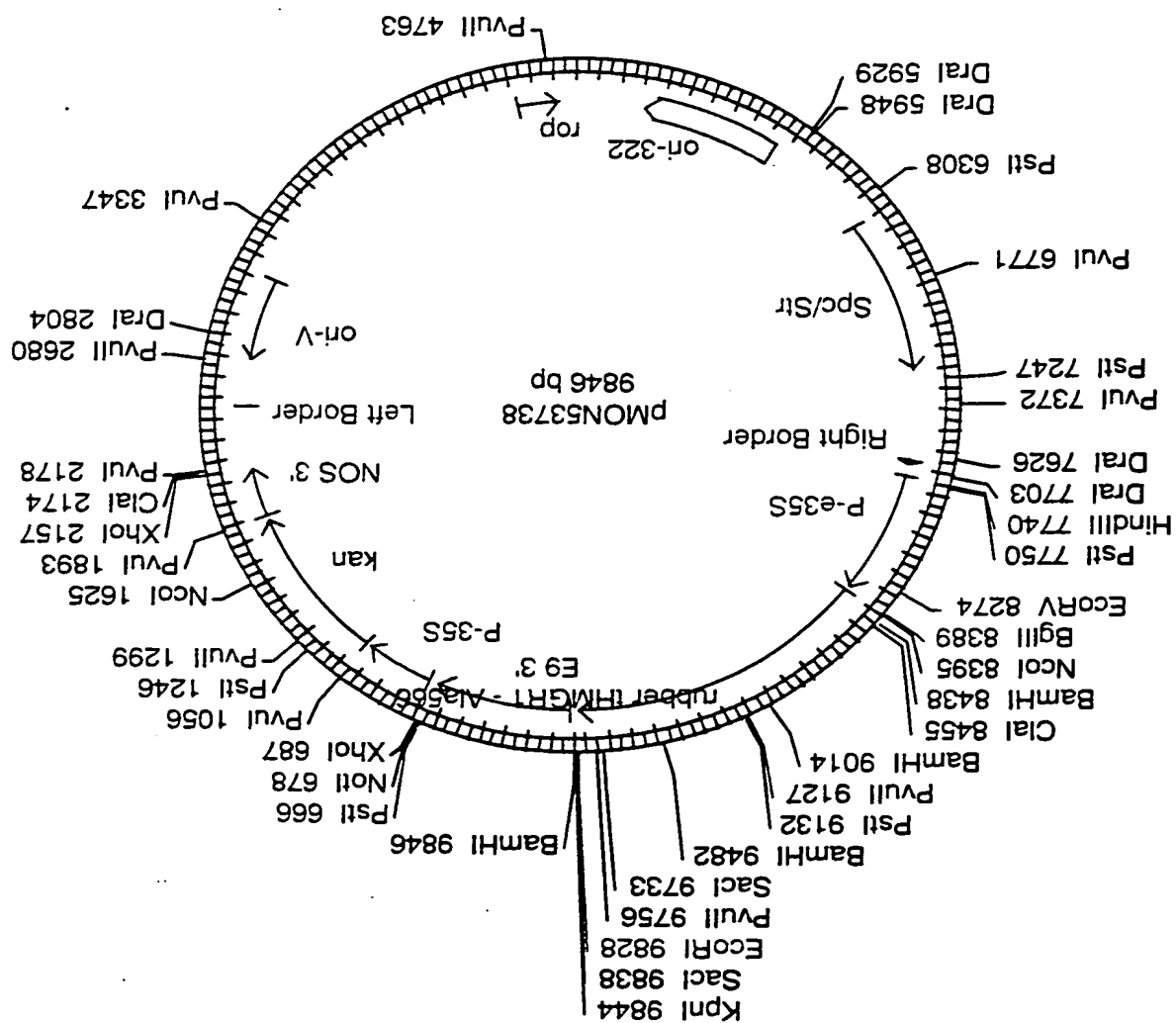
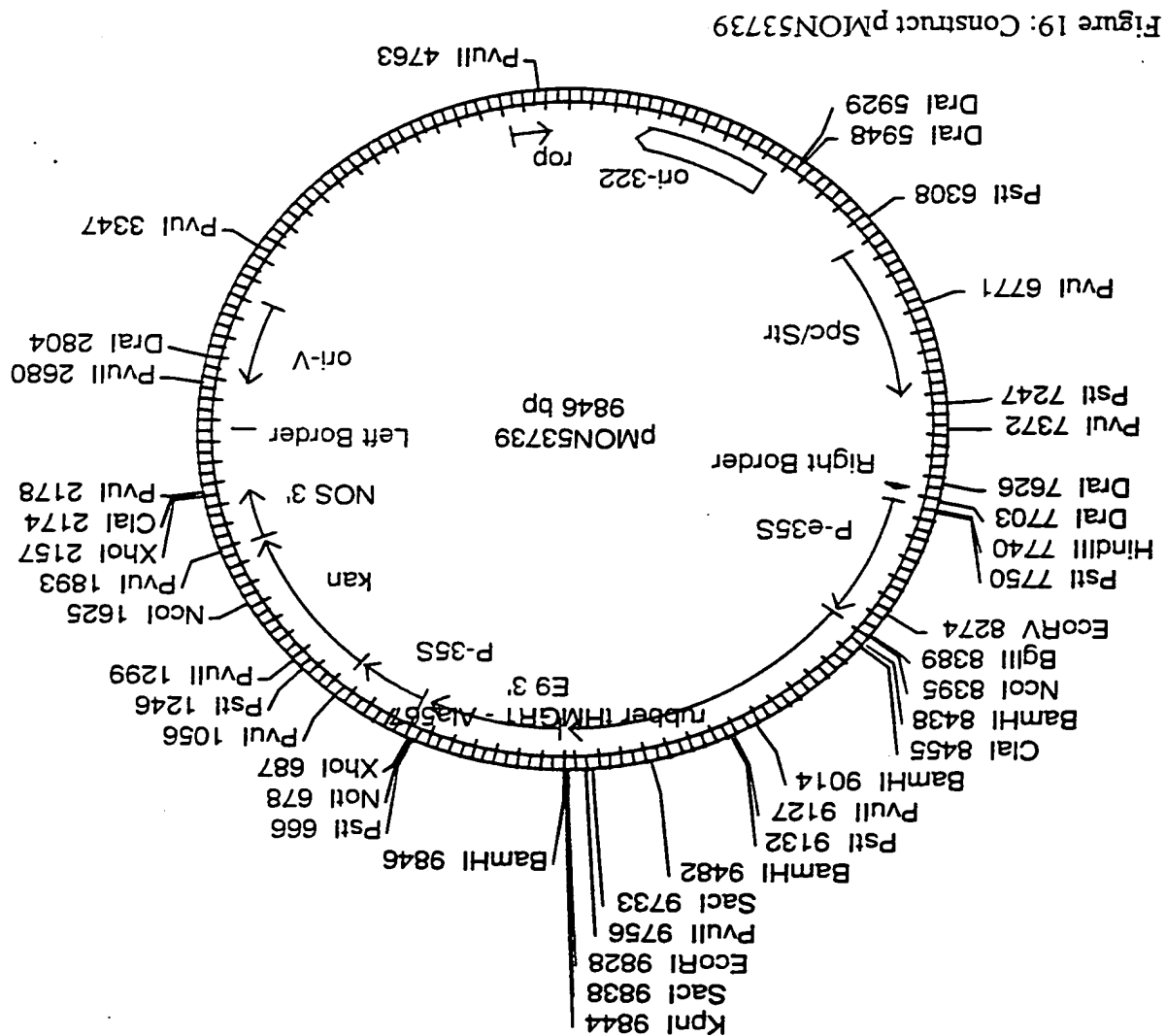


Figure 18: Construct pMON53738



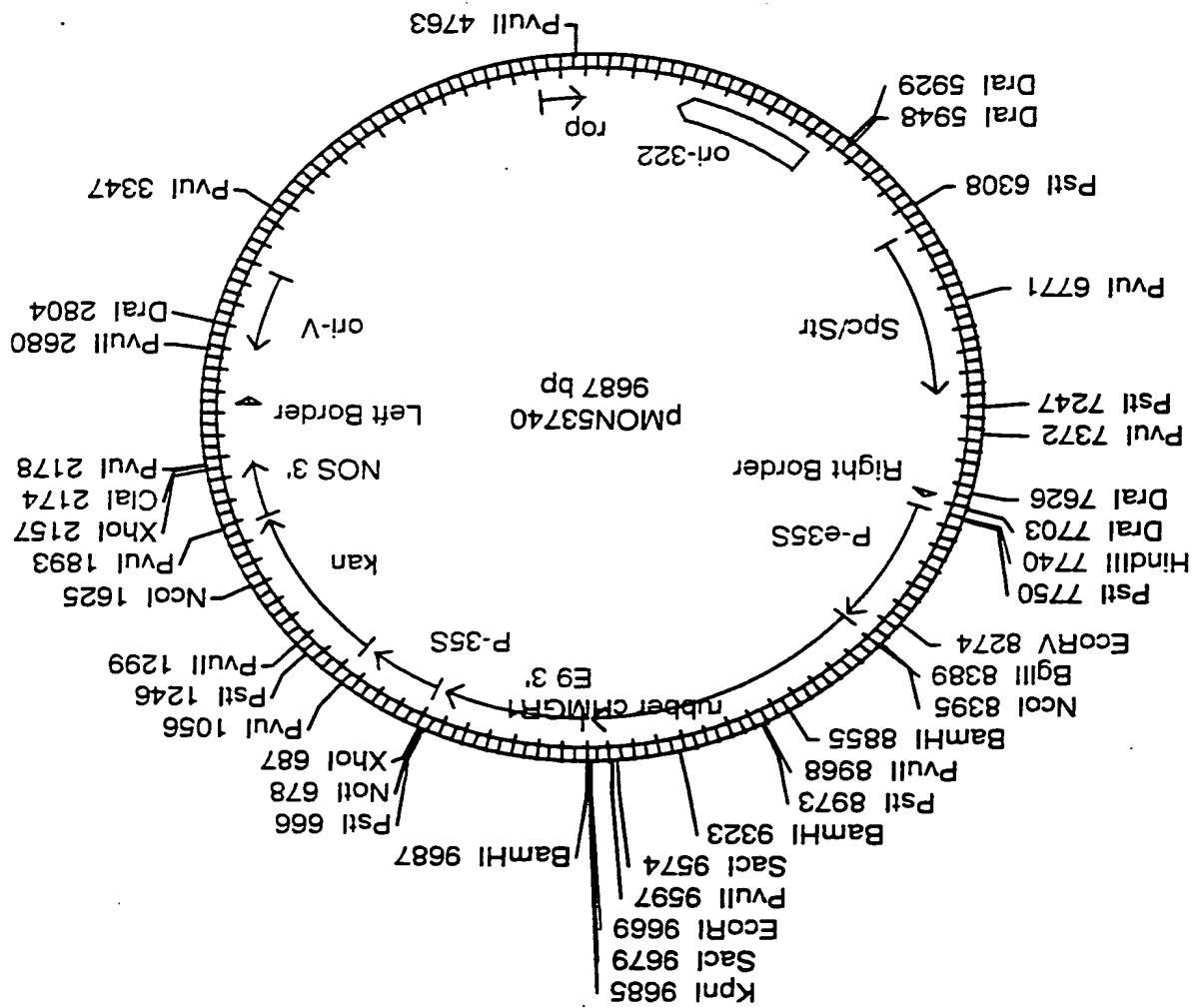


Figure 20: Construct pMON53740

FIG. 22

Comparison of 24-Methylene Cycloartenol in Transgenic Plants

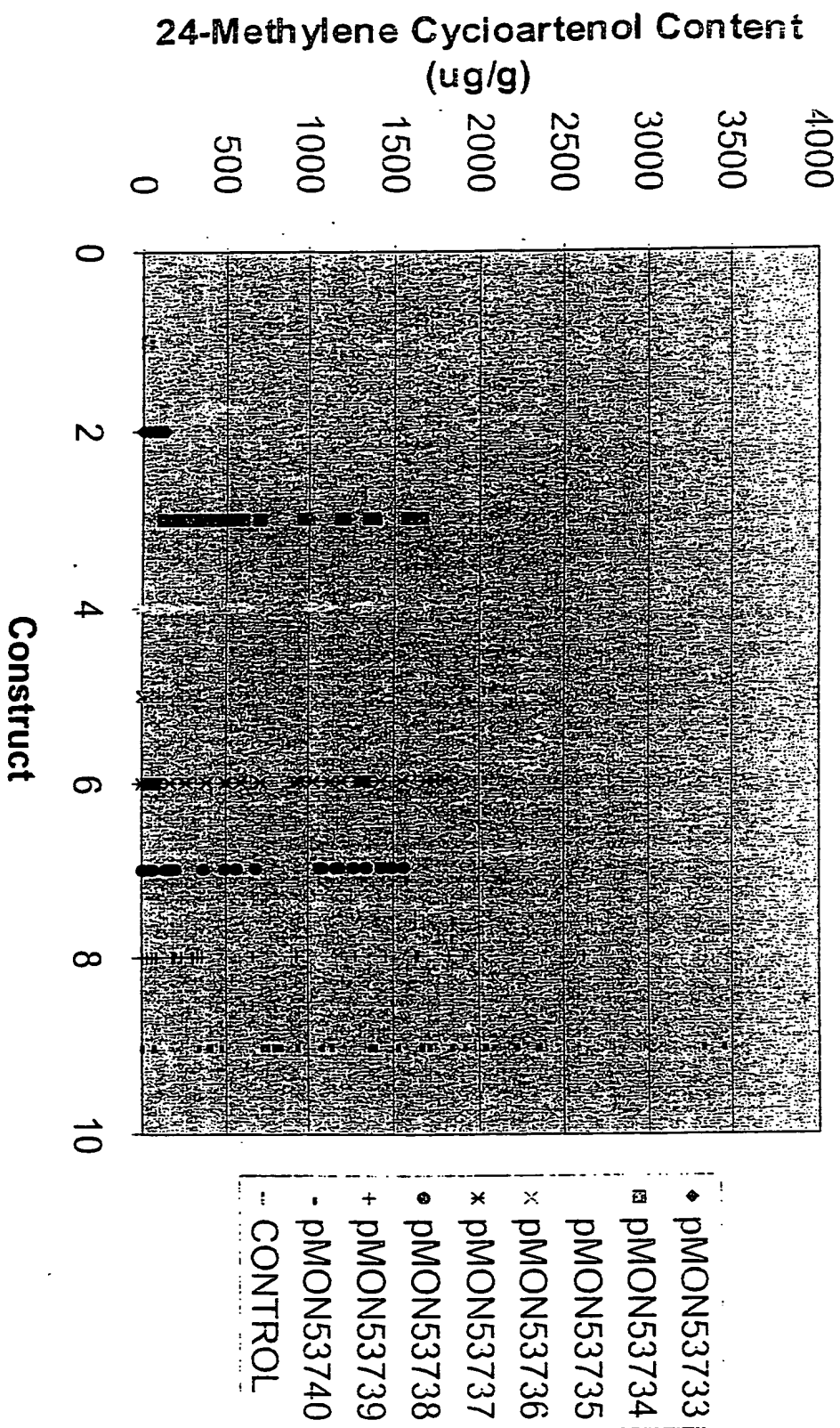


FIG. 23

Comparison of Obtusifolios Levels in Transgenic Plants

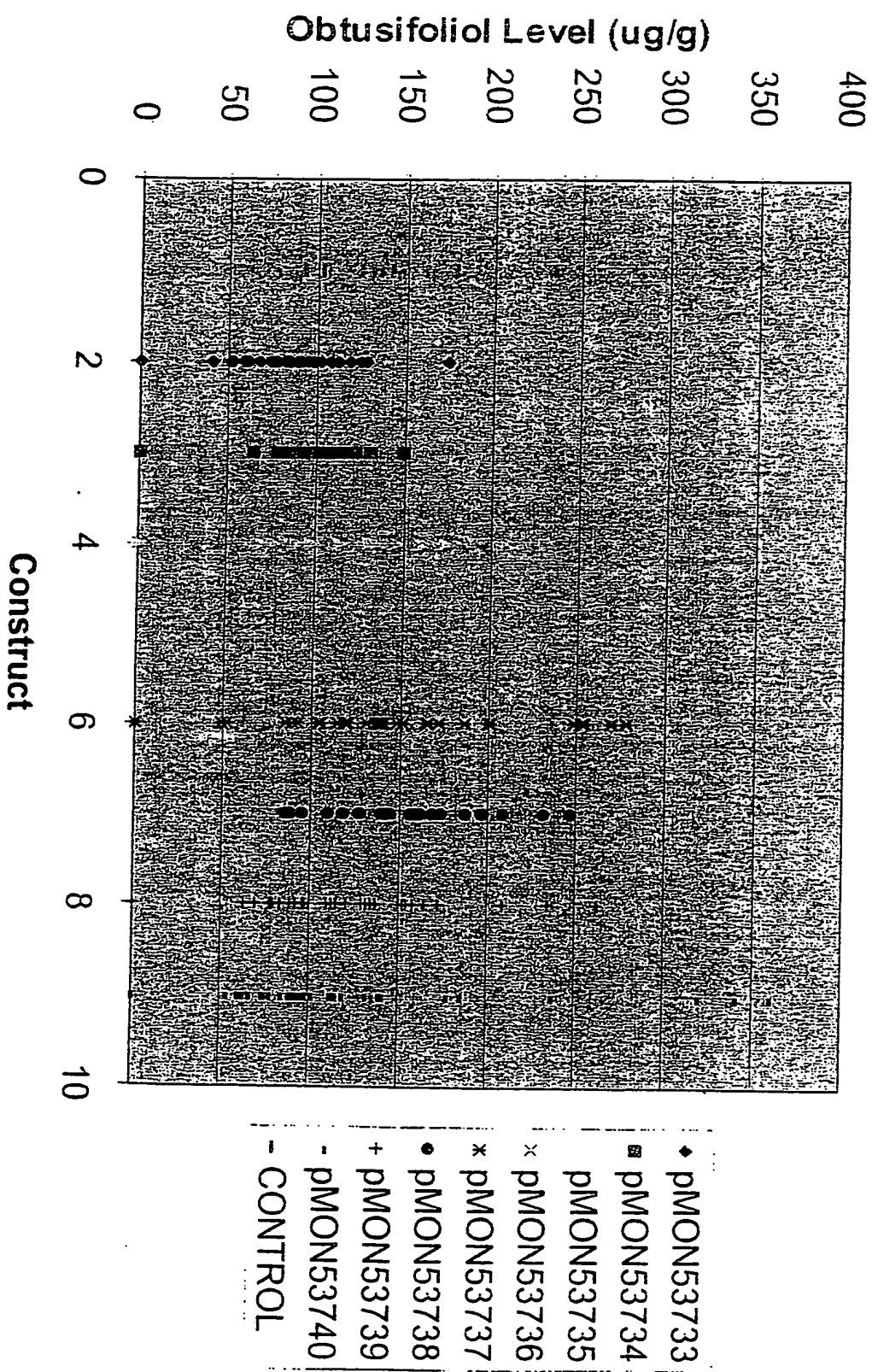


FIG. 24

Comparison of Campesterol Levels in Transgenic Plants

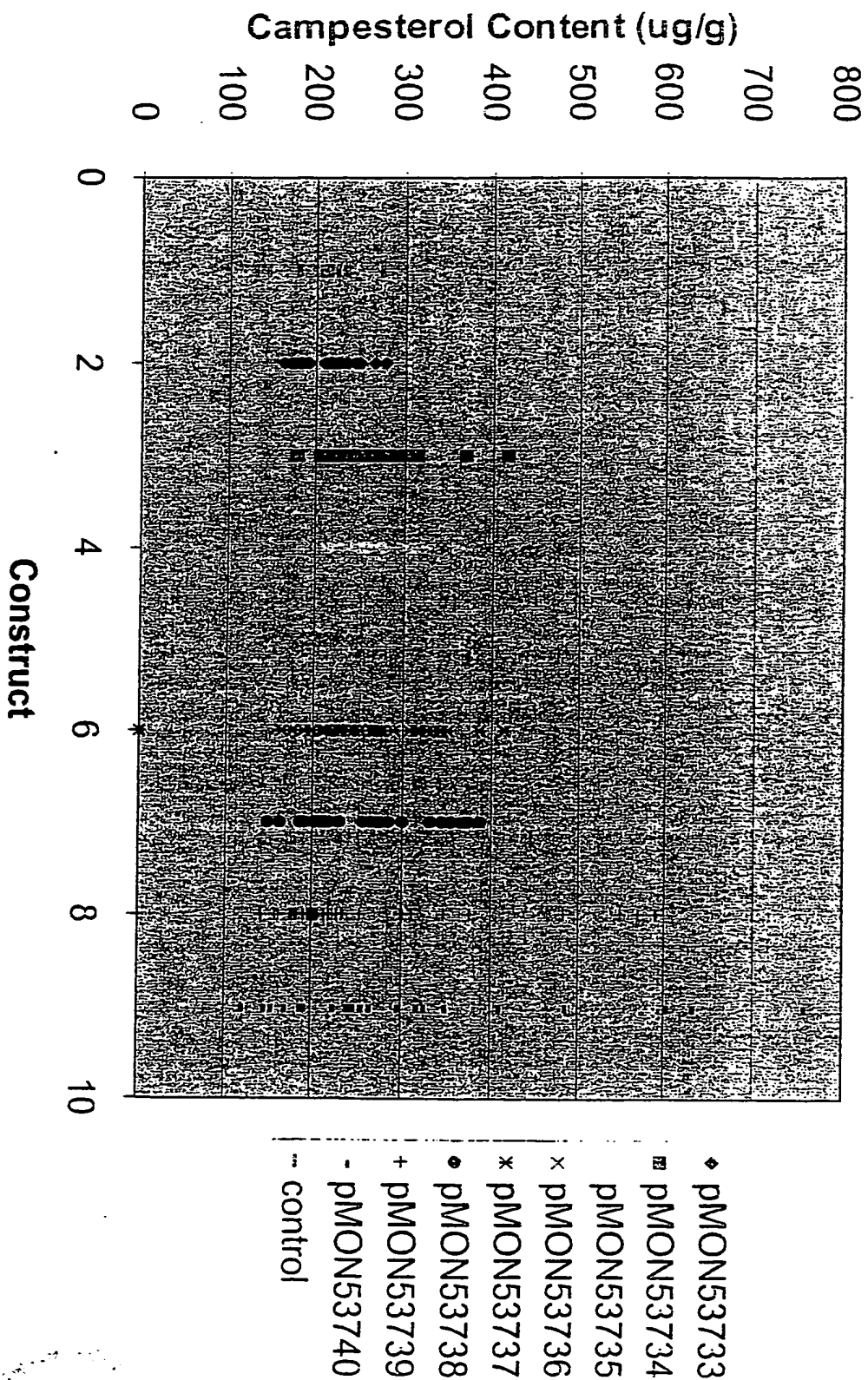


FIG. 25

Comparison of Sitosterol Levels in Transgenic Plants

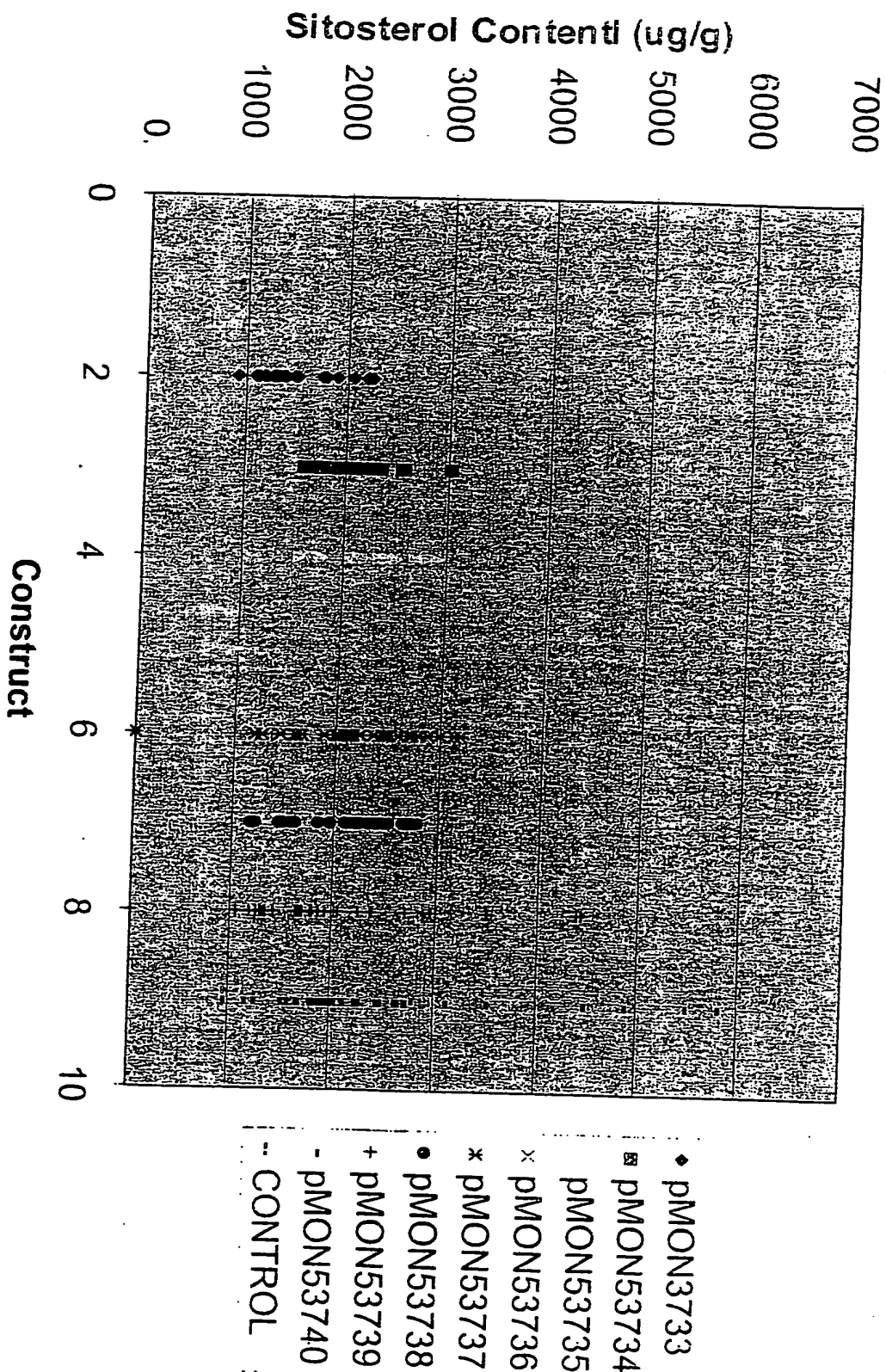
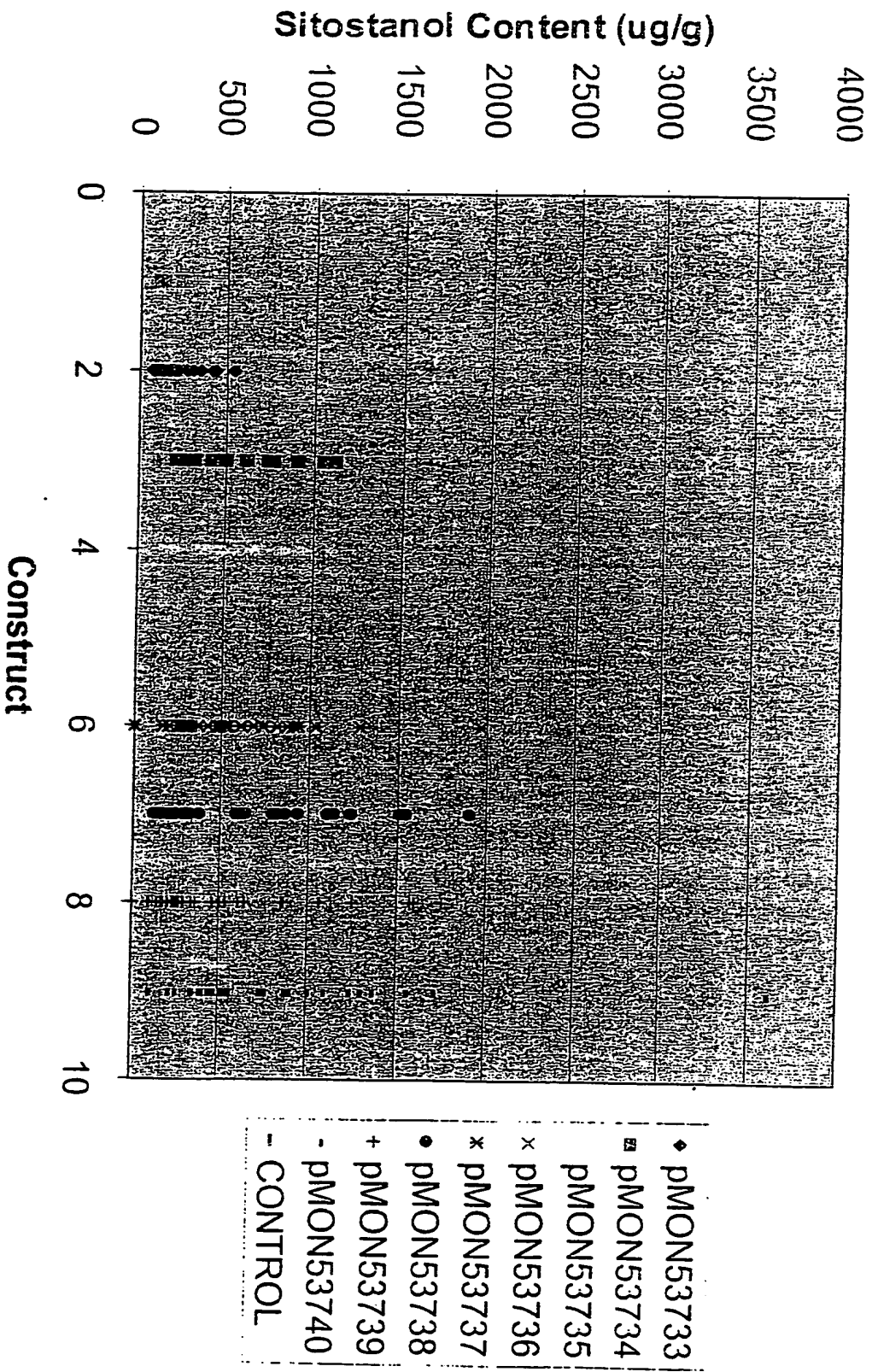


FIG. 26

Comparison of Sitostanol Levels in Transgenic Plants



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FIG. 27

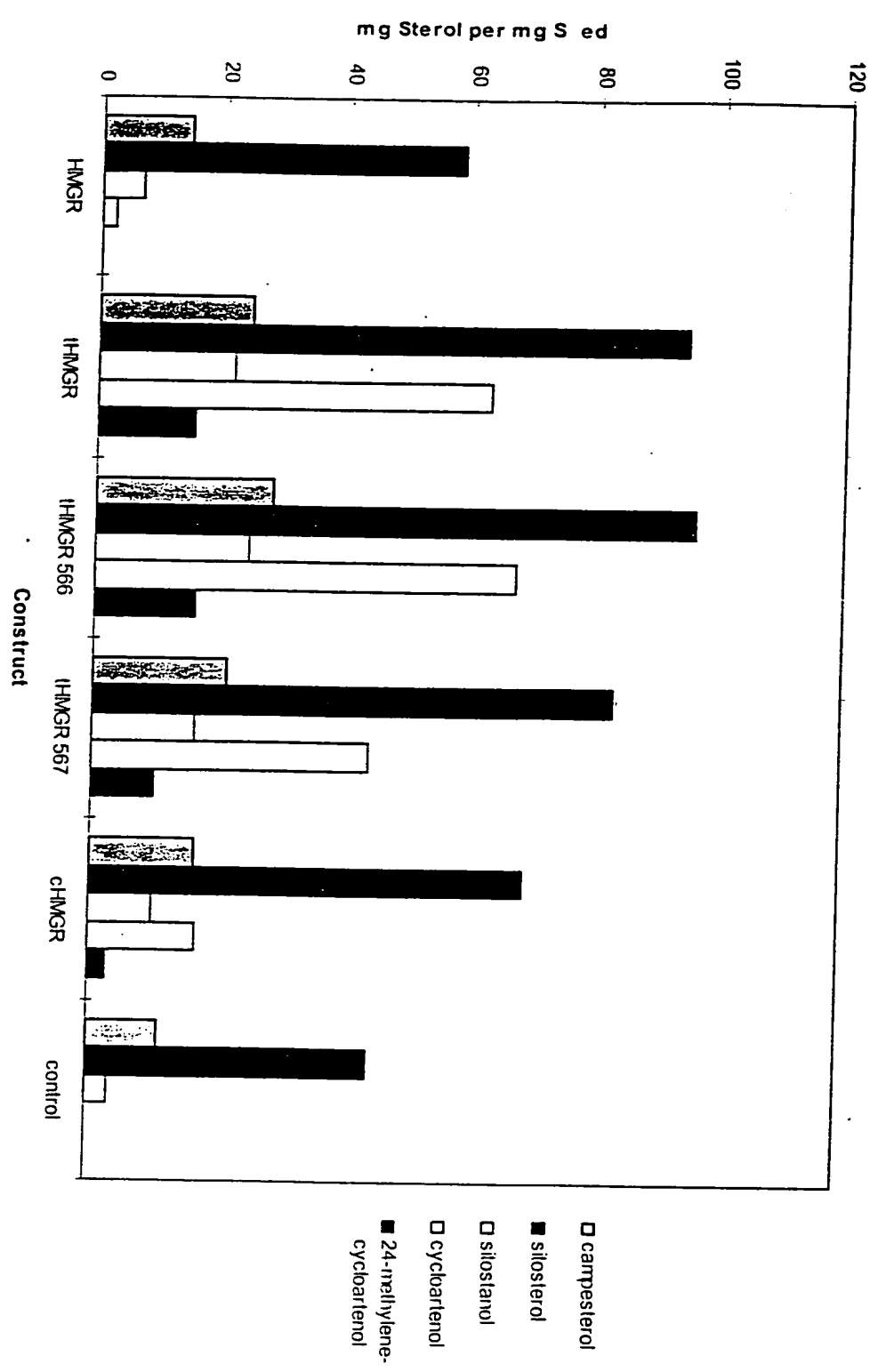
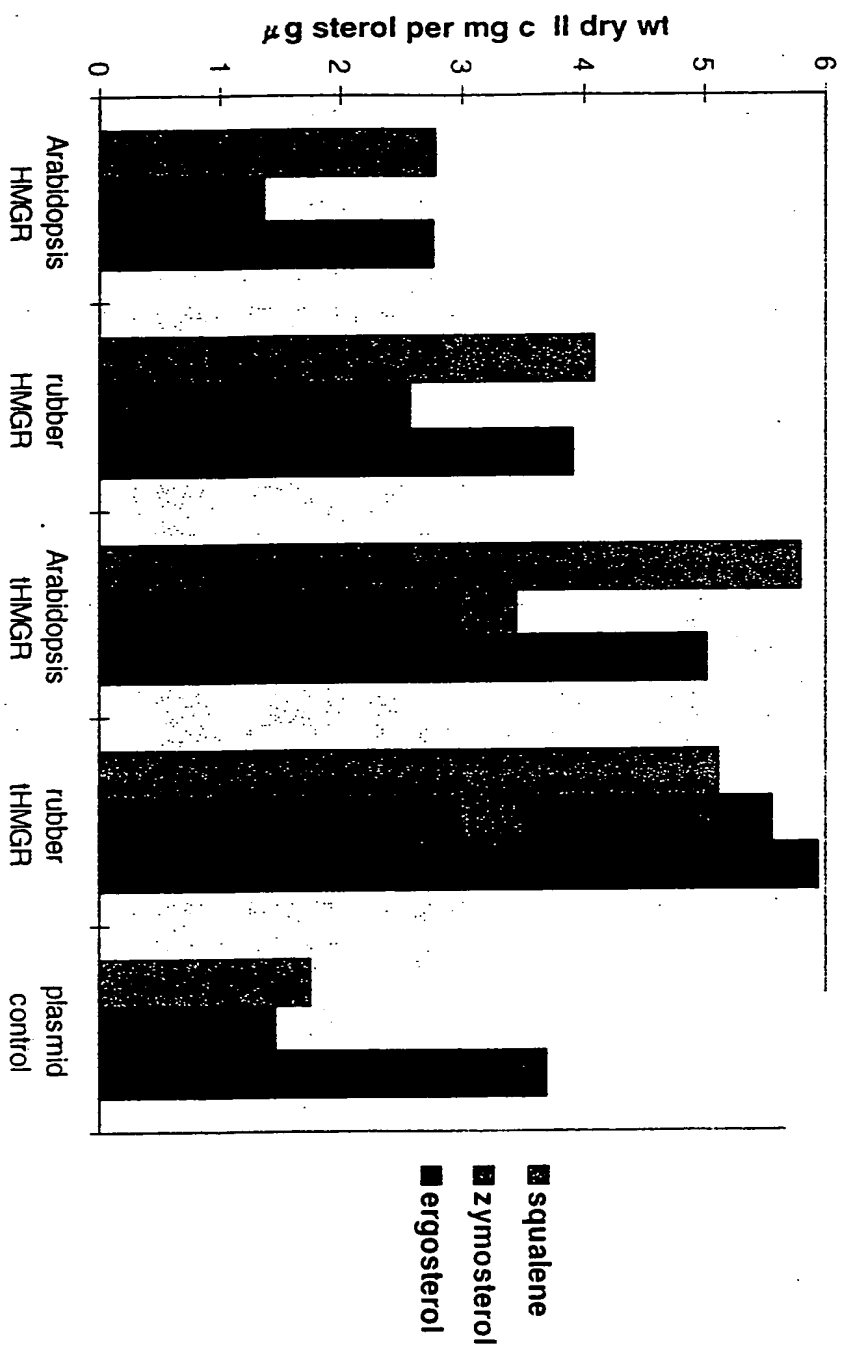


FIG. 28

Plant HMGR Contracts in Yeast HMGR1 Knockout Mutant



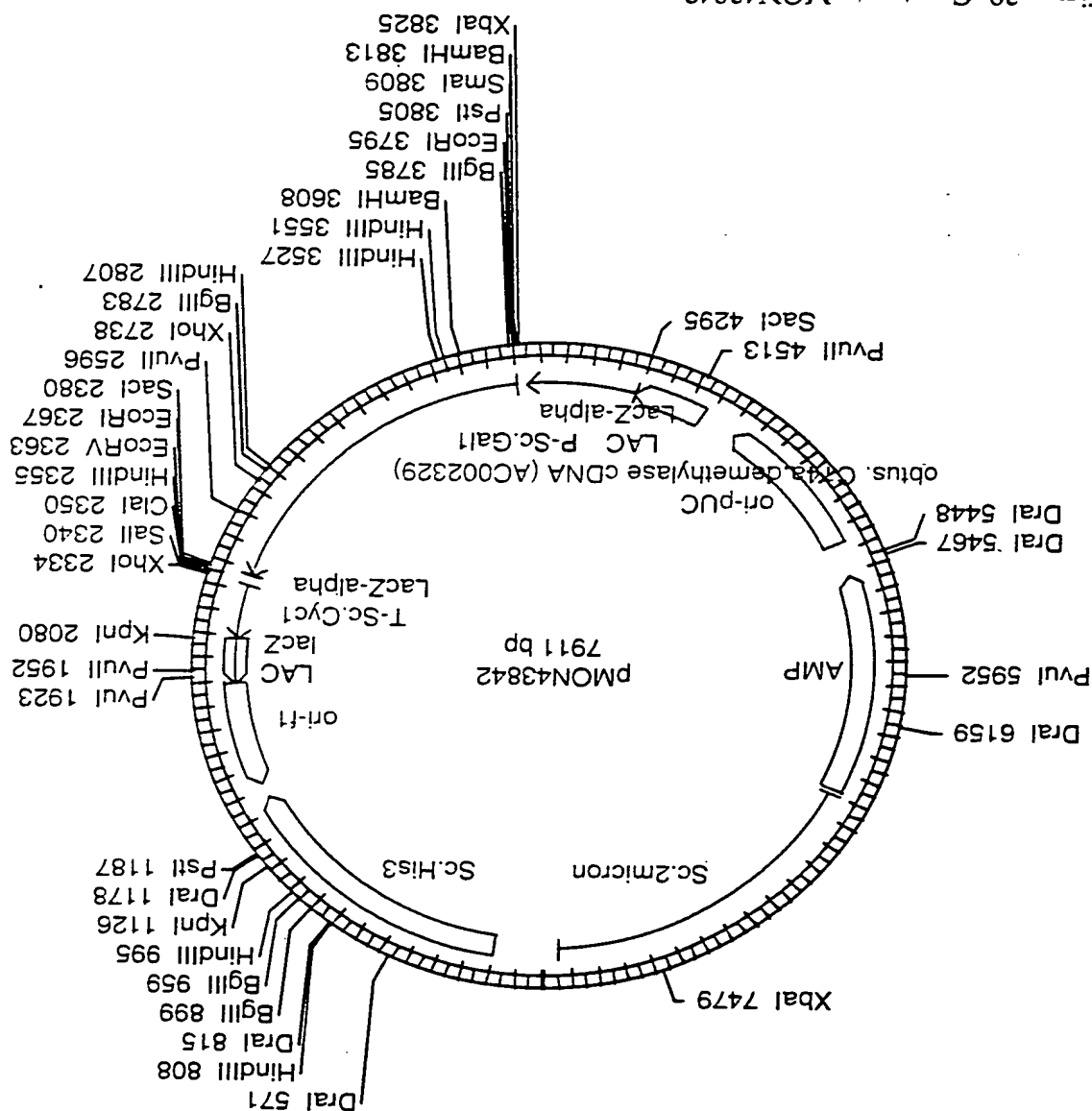
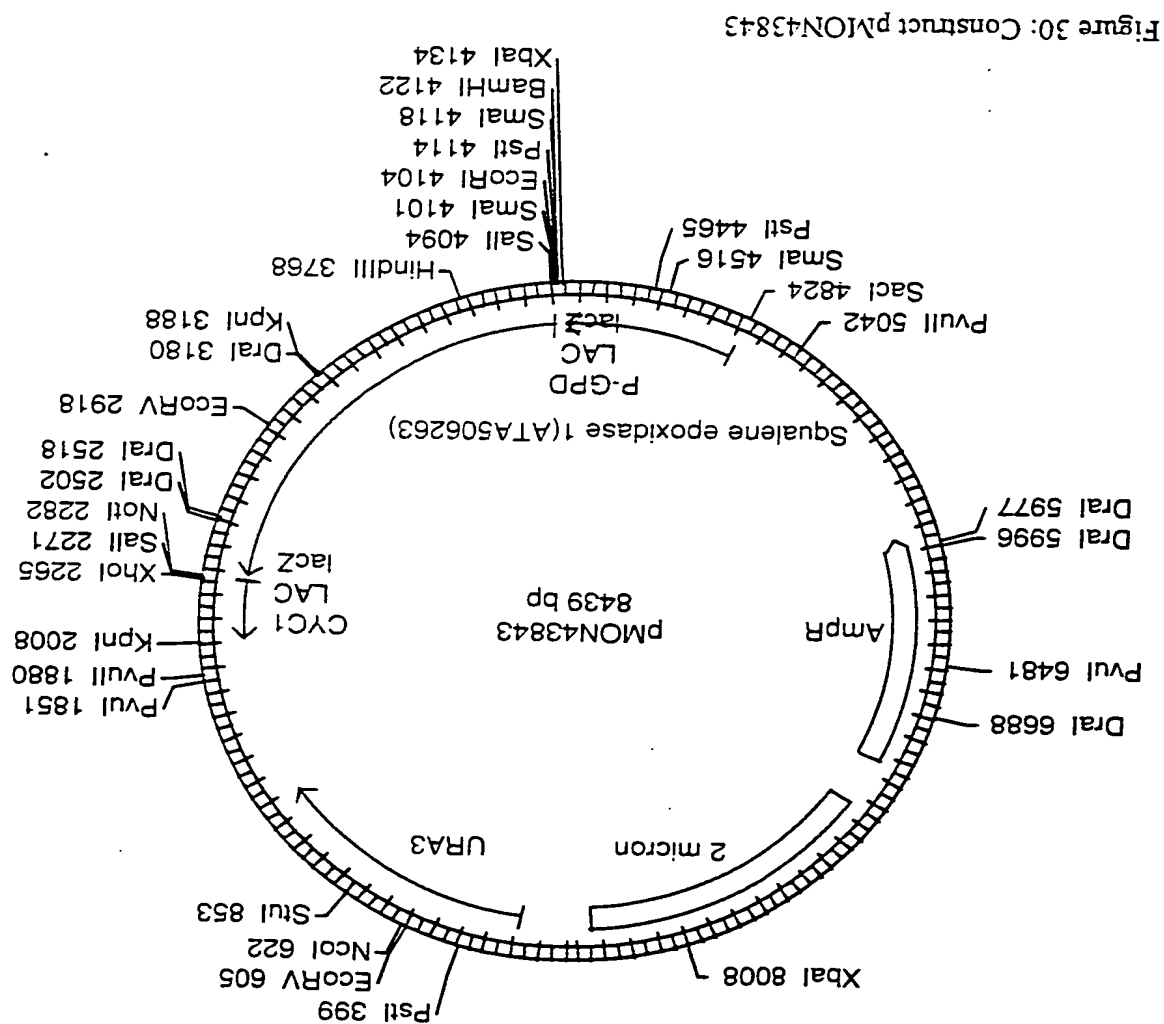


Figure 29: Construct pMON43842



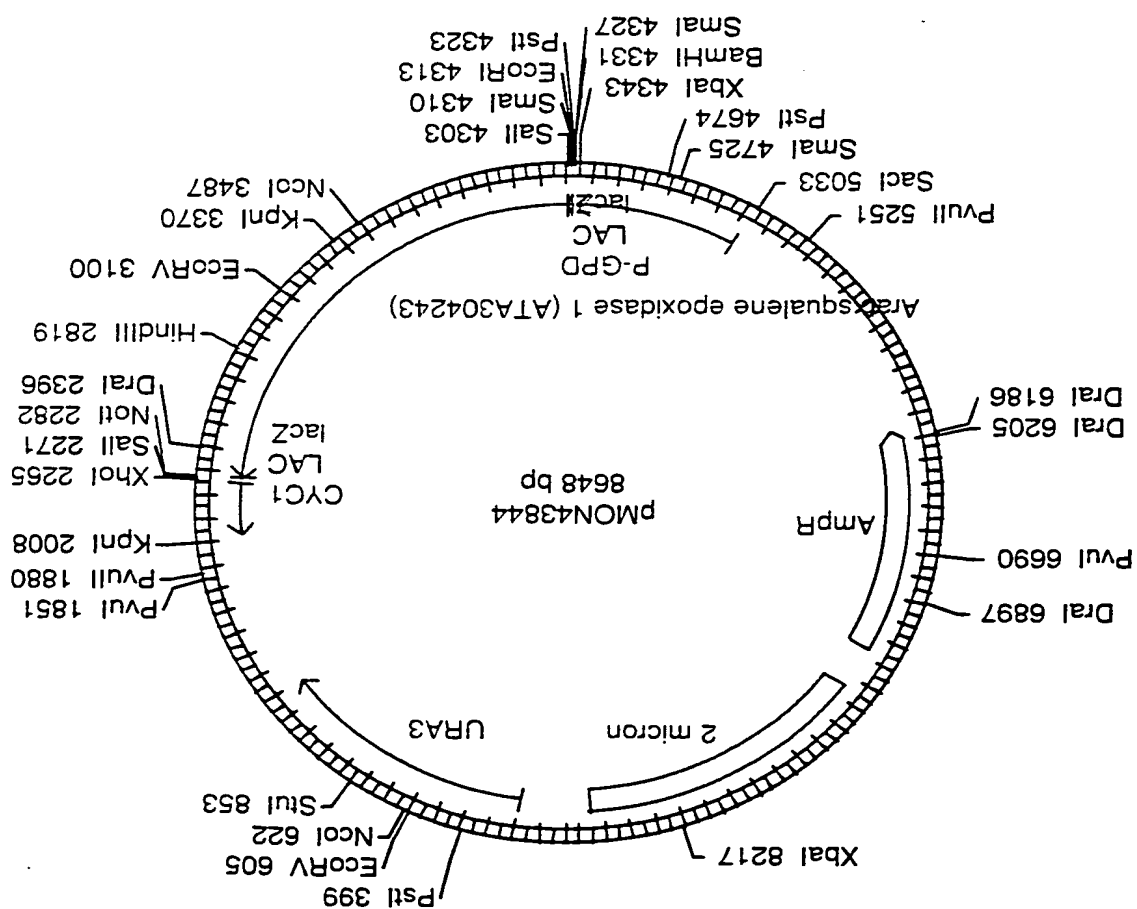


Figure 31: Construct pMON43844

HMGRClustalW{methanobac}	.....
HMGRClustalW{methanococ}	.....
HMGRClustalW{halobacter}	.....
HMGRClustalW{sulfolobus}	.....
HMGRClustalW{yeast2}	MSLPLKTIIVH LKPFACFAR FSARYPPIHVI VVAVLLSAAA
HMGRClustalW{yeast1}	MPPLFKGLKQ MAKPIAYVSR FSAKRPPIHII LFSLLISAF
HMGRClustalW{phycomycetes}	.....
HMGRClustalW{fusarium}	.....
HMGRClustalW{candida}	.....
HMGRClustalW{dictyostez}	.....
HMGRClustalW{wheat1}	.....
HMGRClustalW{rice}	.....
HMGRClustalW{corn}	.....
HMGRClustalW{wheat3}	.....
HMGRClustalW{wheat2}	.....
HMGRClustalW{soybean}	.....
HMGRClustalW{rubbertree3}	.....
HMGRClustalW{rosypertwi}	.....
HMGRClustalW{tomato}	.....
HMGRClustalW{woodtobacc}	.....
HMGRClustalW{potato}	.....
HMGRClustalW{radish}	.....
HMGRClustalW{arabadopstis1}	.....
HMGRClustalW{cucumismel}	.....
HMGRClustalW{rubbertree2}	.....
HMGRClustalW{rubbertree1}	.....
HMGRClustalW{camptothec}	.....
HMGRClustalW{arabadops2}	.....
HMGRClustalW{chineseham}	.....

50

Plurality: 5.00 Threshold: 4 AveWeight 1.00 AveMatch 2.91 AvMatch 2.00

FIG. 32A

HMGRclustalW{chinese2}	.....	Consensus	-----
HMGRclustalW{syrhamst}	.....	
HMGRclustalW{rat}	.....	
HMGRclustalW{rabbit}	.....	
HMGRclustalW{human}	.....	
HMGRclustalW{mouse}	.....	
HMGRclustalW{xenopus}	.....	
HMGRclustalW{sea urchin}	.....	
HMGRclustalW{cockroach}	.....	
HMGRclustalW{drosophila}	.....	
HMGRclustalW{dictyostel}	.....	
HMGRclustalW{schistosom}	.....	
HMGRclustalW{archaeoglo}	.....	
HMGRclustalW{pseudomonas}	.....	

FIG. 32B

15

001

HMGRClustalW{methanobac}

HMGRClustalW{methanococ}

```
HMGRCLustain{halobacter}
```

{snoitotns}mtatntrgm

Yeast { MGRCLUSTALW {

Yeast { MGRCLUSTALM {

14-00000

SMANSAMO
HMGRCISLADWY \ WNTTBSOT

RECEIVED
JAN 10 1964

[7250(725P)]MTRASPTAYD-PI

(123456) 456789101112

(2211) \MIRASPTANOLW

[REDACTED] RESPONSIBILITY

[REDACTED] INFORMATION

(continued)

.....
[unclear]

[REDACTED]

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.....

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.....

.....

.....

EVASHPWE

.

EWKIDSN.QY STYLISIKPDE LFEKCETHYYR SPVSDTWLTL
GWOILDNSNVE ELAPNKDSNT LFQECSHYYR DSSLDCWASI
.

MDH EGCGQHBPQQ
MEFH GASNQHMIYA
.

MTSRLEFRMH
.

Species	Consensus
GLFVASHPWE	HMGRclustalw{syrianhamst}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{rat}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{rabbit}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{human}
GLFVASHPWE	HMGRclustalw{mouse}
GLFVASHPWE	HMGRclustalw{xenopus}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{sea urchin}
GLFVASHPWE	GRFCSSHPE
GLFVASHPWE	HMGRclustalw{cockroach}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{drosophila}
GLFVASHPWE	GLFVASHPWE
GLFVASHPWE	HMGRclustalw{dictyostel}
GLFVASHPWE	HMGRclustalw{schistosom}
GLFVASHPWE	HMGRclustalw{archaeoglo}
GLFVASHPWE	HMGRclustalw{pseudomonas}
GLFVASHPWE	Consensus

101

[illegible]

FIG. 32F

HMGRclustalW{chinese2}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{syrhanhamst}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{rat}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{rabbit}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{human}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{mouse}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{xenopus}	VIVGTVT..L TICMMSMN.. MFTGNK..
HMGRclustalW{sea urchin}	VIVCTLT..L TICMMSMN.. YFTGLPR..
HMGRclustalW{cockroach}	VIVATLT..L TVCMLTVDP.. RPLGLP..
HMGRclustalW{drosophila}	VIVATLT..L TACMLTNGQE QYPGCEQRIQ HSTASAAAAG
HMGRclustalW{dictyostel}	VIVATLT..L TACMLTNGQE QYPGCEQRIQ HSTASAAAAG
HMGRclustalW{schistosom}	VIVATLT..L TACMLTNGQE QYPGCEQRIQ HSTASAAAAG
HMGRclustalW{archaeoglo}	VIVATLT..L TACMLTNGQE QYPGCEQRIQ HSTASAAAAG
HMGRclustalW{pseudomonas}	VIVATLT..L TACMLTNGQE QYPGCEQRIQ HSTASAAAAG
Consensus	VIVGTVT..L TICMMSMN.. MFTGNK..

FIG. 326

200	HMGRClustalW{methanobac}	.....
	HMGRClustalW{methanococ}	.....
	HMGRClustalW{halobacter}	.....
	HMGRClustalW{sulfolobus}	.....
	HMGRClustalW{yeast2}	.....	NGTKWRLRNN SNFILDLENI YRNMVKQFSN KITSEFDQFDL
	HMGRClustalW{yeast1}	.....	DGTKWRLRSD RKSLEFDVKTL AYSLYDFESE NVTQADPFDV
	HMGRClustalW{phycomyces}	.....
	HMGRClustalW{fusarium}	.....	SSVFAFLFGL VTTKLGVP I SVILLSEGLP FLVVTIGFEK
	HMGRClustalW{candida}	.....	DGTWRSRAY HGKLGKYS DM AVGAFNKKVLN LVGAETFDI
	ALVTCAVIAM		
	HMGRClustalW{dictyostez}	.....
	HMGRClustalW{wheat1}	.....
	HMGRClustalW{rice}	.....
	HMGRClustalW{corn}	.....
	HMGRClustalW{wheat3}	.....
	HMGRClustalW{wheat2}	.....
	HMGRClustalW{soybean}	.....
	HMGRClustalW{rubbertree3}	.....
	HMGRClustalW{rosypertiwi}	.....
	HMGRClustalW{tomato}	.....
	HMGRClustalW{woodtobacc}	.....
	HMGRClustalW{potato}	.....
	HMGRClustalW{radish}	.....
	HMGRClustalW{arabadopis1}	.....
	HMGRClustalW{cucumis mel}	.....
	HMGRClustalW{rubbertree2}	.....
	HMGRClustalW{rubbertree1}	.....
	HMGRClustalW{camptothec}	.....
	HMGRClustalW{arabadopis2}	.....
	HMGRClustalW{chinese ham}	.....	I CGWNYEC.PK FEEDVLSSDI
	ILLITIRCIA		

IIITTRCIA	Consensus	-----I CGWNYEC-PK FEEDVLSDDI
.....		
HMGRClustalW{pseudomonas}		.....
.....		
HMGRClustalW{archaeoglo}		.....
.....		
VLTLVLFTRL		.....M LKILNTVLLF FDCFSGTGTF
HMGRClustalW{schistosom}		.....
.....		
HMGRClustalW{dictyostel}		.....
.....		
ILMTIVRCTA		.....
HMGRClustalW{drosophila}	GTIPSSMGG SATSSRHRPC HGWQSC DG LEAFYNAADV	
.....		
IVMTLIRCA		.....
HMGRClustalW{cockroach}	.....PGWGHNC..I TLEFYNAADM	
.....		
IVMCMRTIA		.....
HMGRClustalW{sea urchin}	.....I CGWNYECAPQ VKESLSDDV	
.....		
IIITTRCIA		.....
HMGRClustalW{xenopus}	.....I CGWNYAC.PK FEEDVLSDDI	
.....		
HMGRClustalW{mouse}	.....	.....
.....		
IIITTRCIA		.....
HMGRClustalW{human}	.....I CGWNYEC.PK FEEDVLSDDI	
.....		
IIITTRCIA		.....
HMGRClustalW{rabbit}	.....I CGWNYEC.PK FEEDVLSDDI	
.....		
IIITTRCIA		.....
HMGRClustalW{rat}	.....I CGWNYEC.PK FEEDVLSDDI	
.....		
IIITTRCIA		.....
HMGRClustalW{syrrianhamst}	.....I CGWNYEC.PK FEEDVLSDDI	
.....		
IIITTRCIA		.....
HMGRClustalW{chinese2}	.....I CGWNYEC.PK FEEDVLSDDI	

FIG. 32H

HMGRclustalw{methanobac} 250
 HMGRclustalw{methanococ}
 HMGRclustalw{halobacter}
 HMGRclustalw{sulfolobus}
 HMGRclustalw{yeast2} STLKGPASTL
 HMGRclustalw{yeast1} CILGKEVSAT
 HMGRclustalw{phycomyces}
 HMGRclustalw{fusarium} FEIRDYAIE
 HMGRclustalw{candida} RVLDSLIPFL
 HMGRclustalw{dictyostez}
 HMGRclustalw{wheat1}
 HMGRclustalw{rice}
 HMGRclustalw{corn}
 HMGRclustalw{wheat3}
 HMGRclustalw{wheat2}
 HMGRclustalw{soybean}
 HMGRclustalw{rubbertrez3}
 HMGRclustalw{rosypertiwi}
 HMGRclustalw{tomato}
 HMGRclustalw{woodtobacc}
 HMGRclustalw{potato}
 HMGRclustalw{radish}
 HMGRclustalw{arabadops1s1}
 HMGRclustalw{cucumisamel}
 HMGRclustalw{rubbertrez2}
 HMGRclustalw{rubbertrei}
 HMGRclustalw{camptothec}
 HMGRclustalw{arabadops2}
 HMGRclustalw{chineseham} ILIYIFOFON LRQLGSKYIL GIAGLFTIFS SEVESWVIH

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Species	Consensus
HMGRClustalW(chinese2)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(syrianhamst)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(rat)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(rabbit)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(human)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(mouse)	.....
HMGRClustalW(xenopus)	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH
HMGRClustalW(sea urchin)	VAVLYLQFTK LRRTGSKYIL GIAGLTIFS SFLSSAVIH
HMGRClustalW(cockroach)	VLVSYYQFCH LQKLGSKYIL GIAGLTIFS SEFSSSVIN
HMGRClustalW(drosophila)	VLVCYYQFCS LHRLGSKYVL GIAGLTIFS SFIFTAIK
HMGRClustalW(dictyostel)	.....
HMGRClustalW(schistosom)	RTHLTHFSSS NCHLDVVIYQ SRAVILVLV FVYFIVGLTC
HMGRClustalW(archaeoglo)	.....
HMGRClustalW(pseudomonas)	.....
Consensus	ILYIFQFN LRQGSKYIL GIAGLTIFS SEFSTVVIH

FIG. 32K

251

300

Accession	Gene Name	Species	Accession	Gene Name	Species
HMGRc1ustaiW{methanobac			HMGRc1ustaiW{methanobac		
HMGRc1ustaiW{methanococ			HMGRc1ustaiW{halobacter		
HMGRc1ustaiW{sulfolobus			HMGRc1ustaiW{yeast2		
HMGRc1ustaiW{yeast1			HMGRc1ustaiW{yeast1		
HMGRc1ustaiW{phycomyces			HMGRc1ustaiW{rice		
HMGRc1ustaiW{corn			HMGRc1ustaiW{wheat3		
HMGRc1ustaiW{wheat2			HMGRc1ustaiW{soybean		
HMGRc1ustaiW{rubbertree3			HMGRc1ustaiW{rubbertree2		
HMGRc1ustaiW{rubbertree1			HMGRc1ustaiW{rubbertree1		
HMGRc1ustaiW{tomato			HMGRc1ustaiW{tomato		
HMGRc1ustaiW{woodbacc			HMGRc1ustaiW{potato		
HMGRc1ustaiW{arabidopsi1			HMGRc1ustaiW{arabidopsi1		
HMGRc1ustaiW{cucumis1			HMGRc1ustaiW{cucumis1		
HMGRc1ustaiW{rubbertree2			HMGRc1ustaiW{rubbertree1		
HMGRc1ustaiW{rubbertree1			HMGRc1ustaiW{campothec		
HMGRc1ustaiW{arabidopsi2			HMGRc1ustaiW{chineseham		

ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{chinese2}	VLANYFFVMT
ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{syrhambast}	VLANYFFVMT
ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{rat}	VLANYFFVMT
ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{rabbit}	VLANYFFVMT
ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{human}	VLANYFFVMT
ILGPTFTLDA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{mouse}	VLANYFFVMT
ILGPTFTLEA LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalw{xenopus}	VLANYFFVMT
ILGPTITLDT VV.TTLVIS IGTMSGVRQL EVFCFGILS	VLANYFFVMT	VLANYFFVMT
MLGPTITLDT VV.ETLVIG VGTMSGVRQL EVLCFFACMS	VLANYFFVMT	VLANYFFVMT
ILGPAISLDT IV.VLLVG VGTLSGVQL EVLCMFAVLS	HMGRClustalw{drosophila}	VLANYFFVMT
DLVFFIVLE YLLIEILVN YEHAKRHCLT SHLFSNQLFV	ILIPKFAKV	DMGLGMFLKT
.....	HMGRClustalw{schistosom}	DMGLGMFLKT
.....	HMGRClustalw{archaeoglo}	.....
.....	HMGRClustalw{pseudomonas}	.....
ILGPTFTLDA LV--ECLVIG VGTASD-LPL-LYCFFGCMS	Consensus	VLANYFFVMT

FIG. 32N

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400

Accession	Species	Gene	Protein	Accession	Species	Gene	Protein
HMGRc1ustaiw{methanobac	Methanobacterium			HMGRc1ustaiw{methanococ	Methanococcus		
HMGRc1ustaiw{halobacter	Halobacterium			HMGRc1ustaiw{sulfolobus	Sulfolobus		
HMGRc1ustaiw{yeast2}	Saccharomyces	YKDETASEPH	Yeast2	HMGRc1ustaiw{yeast1}	Saccharomyces	YSALATLRL	Yeast1
HMGRc1ustaiw{fusarium}	Fusarium	FKVLMILGFI	Fusarium	HMGRc1ustaiw{candida}	Candida	FLSALISLKL	Candida
HMGRc1ustaiw{dictyostez}	Dictyostelium			HMGRc1ustaiw{wheat1}	Triticum		
HMGRc1ustaiw{rice}	Oryza	LVLSSCDLVR	Rice	HMGRc1ustaiw{corn}	Zea mays	FAASLAYLMR	Corn
HMGRc1ustaiw{wheat3}	Triticum			HMGRc1ustaiw{wheat2}	Triticum		
HMGRc1ustaiw{soybean}	Glycine			HMGRc1ustaiw{rubbertree3}	Hevea	FFSVAYFLTH	Rubber tree
ALICLVASVI	Hevea			HMGRc1ustaiw{rosyperiwi}	Persea	FFSVMYFLLT	Rosemary
ATASLIASVI	Persea			HMGRc1ustaiw{tomato}	Solanum	FFSVMYFLLS	Tomato
ATASLIASVI	Solanum			HMGRc1ustaiw{woodtobacc}	Nicotiana	FFSVMYFLLS	Tobacco
AMVSLIASVI	Nicotiana			HMGRc1ustaiw{potato}	Solanum	FFSVMYFLLV	Potato
HMGRc1ustaiw{radish}	Raphanus	FFSVAYYLLH	Radish	HMGRc1ustaiw{cucumismel}	Cucumis	FFSVAYYLLH	Cucumber
HMGRc1ustaiw{arabadosis1}	Arabidopsis	FFSVAYYLLH	Arabidopsis1	HMGRc1ustaiw{rubbertree2}	Hevea		
HMGRc1ustaiw{rubbertree1}	Hevea	FFSVAYYLLH	Rubber tree	HMGRc1ustaiw{campthotec}	Camptotheca	FFTVVYYLLV	Camptotheca
HMGRc1ustaiw{chineseham}	Chinese ham	FFPACVSLV	Chinese ham	HMGRc1ustaiw{arabadosz}	Arabidopsis	FEATVYFLLS	Arabidopsis2
HMGRc1ustaiw{chineseham}	Chinese ham	FFPACVSLV	Chinese ham	HMGRc1ustaiw{chineseham}	Chinese ham	FFPACVSLV	Chinese ham

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Consensus	FFSACYSLTL - WRRKIRNST PLHV - - - LSH FARVTLLEEAA AKGN -
HMGRClustalW{chinese}haz	FFPACVSLVL ELSRESREGR PIWQ..LSH FARVLEE..
HMGRClustalW{syr}ianhamast	FFPACVSLVL ELSRESREGR PIWQ..LSH FARVLEE..
HMGRClustalW{rat}	FFPACVSLVL ELSRESREGR PIWQ..LSH FARVLEE..
HMGRClustalW{rabbit}	FFPACVSLVL ELSRESREGR PIWQ..LSH FARVLEE..
HMGRClustalW{human}	FFPACVSLVL ELSRESREGR PIWQ..LSH FARVLEE..
HMGRClustalW{mouse}	FFPACVSLVL ELSRESREGR PIWQ..LSQ FASVLEEED
HMGRClustalW{xenopus}	FFPACVSLVL ELSRESREGR PIWQ..LSQ FASVLEEED
NKPNVTVQRV	
HMGRClustalW{sea urchin}	FFPACVSLVL ELSNSNKYGR PWH..LGR FAEVLEEED
NKPNVTVQRV	
HMGRClustalW{cockroach}	FFPACVSLVL ELSRSGESGR PAWH..KSL IIKALHEED
NKPNVTVQRV	
HMGRClustalW{drosophila}	FFPACVSLVL DLSRSGVMS VREKAKGSL PLKSLTEEE
QKAPVTLQRV	
HMGRClustalW{dictyostel}	MSVRELTPFF KMGFNIRSN FLVP.....ILSNVI
VTGEEAVQYE	
HMGRClustalW{schistosom}	SLFSISITTSK YAYLESIFKC TLMEOIIVIM IVFVFLPSFM
RIFASXYAKRM	
HMGRClustalW{archaeoglo}	
HMGRClustalW{pseudomonas}	

450	HMGRClustalW{methanobac	.....	.....
	HMGRClustalW{methanococ	.....	.....
	HMGRClustalW{halobacter	.....	.....
	HMGRClustalW{sulfolobus	.....	.....
	HMGRClustalW{yeast2	.....	.....
	HMGRClustalW{yeast1	.....	.....
	NSLYFDKERV	.....	.....
	HMGRClustalW{phycomyces	.....	.....
	HMGRClustalW{fusarium	.....	.....
	PSIHYALGSA	.....	.....
	HMGRClustalW{candida	.....	.....
	SAGNETNDTF	.....	.....
	HMGRClustalW{dictyostez	.....	.....
	HMGRClustalW{wheat1	.....	.....
	HMGRClustalW{rice	.....	.....
	YLLSLFAHPD APATTGDD	.....	.....
	HMGRClustalW{corn	.....	.....
	YLLSFFGIAF VQSISSGDD	.....	.....
	HMGRClustalW{wheat3	.....	.....
	HMGRClustalW{wheat2	.....	.....
	HMGRClustalW{soybean	.....	.....
	HMGRClustalW{rubbertre3	.....	.....
	YLLGFFGIGF VHSFS.RAST	.....	.....
	HMGRClustalW{rosypertiwi	.....	.....
	YLVSFFGLDF VQSLIYKPNN	.....	.....
	HMGRClustalW{tomato	.....	.....
	YLLGFFGIGF VQTFVSRGNN	.....	.....
	HMGRClustalW{woodtobacc	.....	.....
	YLLGFFGIGF VQSFVSRDNN	.....	.....
	HMGRClustalW{potato	.....	.....
	YLLGFFGIGF VQSFVSRSNS	.....	.....
	HMGRClustalW{radish	.....	.....
	YLLGFFGIGF VQSFISRP	.....	.....
	HMGRClustalW{arabadosis1	.....	.....
	YLLGFFGIGF VQSFISRASG	.....	.....
	HMGRClustalW{cucumisrael	.....	.....
	YLLGFFGIGF VQSFARSSP	.....	.....
	HMGRClustalW{rubbertre2	.....	.....
	HMGRClustalW{rubbertre1	.....	.....
	YLLGFFGIGF VQSFARASH	.....	.....
	HMGRClustalW{campothec	.....	.....
	YLLGFFGIGF VQPFTRSSH	.....	.....
	HMGRClustalW{arabados2	.....	.....
	YLLGFFGIGF IFRSS.SD	.....	.....
	HMGRClustalW{chineseham	.....	.....
	LMEDVSKRIE	.....	.....
	KMIMSLGLVL VHAHRSWIAD PSPQNST... TE.HSKVSLG	.....	.....

FIG. 32R

HMGRclustalw{chinesezhaz}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	TE.HSKVSLG
LDEBVSRIE				
HMGRclustalw{syrianhamst}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	TE.HSKVSLG
LDEBVSRIE				
HMGRclustalw{rat}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	AE.QSKVSLG
LAEDVSRIE				
HMGRclustalw{rabbit}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	AD.NSKVSLG
LDEBVSRIE				
HMGRclustalw{human}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	AD.TSKVSLG
LDEBVSRIE				
HMGRclustalw{mouse}				
HMGRclustalw{xenopus}	KMIMSLGLVL	VHAHSRWIAD	PSPQNST...	SISDHEVTTM
LDDMMPKRVE				
HMGRclustalw{sea urchin}	KMIMRTGLVL	VHAHSRWIAD	NDT...	ELMSRDMLYD
GNLITDKKID				
HMGRclustalw{cockroach}	KVIMSAGLML	VHAH.RWRC		L.
HMGRclustalw{drosophila}	KLIMTTGLMA	VHIYSREVP	AAT...	TMVDKTLTPT
LSLNVSNNRT				
HMGRclustalw{dictyostel}	KPLPYIPQHN	Q00Q0KQPS		
HMGRclustalw{schistosom}	YGEQKKCLVS	NKGVSSSTRK	RPHSYSSGHS	YVEYRPMVH
NLIGYVNP				
HMGRclustalw{archaeoglo}				
HMGRclustalw{pseudomonas}				

Consensus YLT-FEG-VL V-A-SR-ISD PSPQNST ---SKVSLG LDE-VSKRIE

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HMGRcInstaIw{methanobac}		
HMGRcInstaIw{methanococ}		
HMGRcInstaIw{halobacter}		
HMGRcInstaIw{sulfolobus}		
HMGRcInstaIw{yeast2}	SLPNFINYKD	IGNLSNQVII SVLPKQYYTP TKKYHQIEDS
HMGRcInstaIw{yeast1}	SLPDIITSNA	SENFKEQAIIV SVTPBLLYYKP IKSYQRIEDM
HMGRcInstaIw{phycomyces}		
HMGRcInstaIw{fusarium}	ASNPAYN.DA	FHHHFQGYGV GGRMVGGILK SLEDPVLSKM
HMGRcInstaIw{candida}	TLPDAVA.DQ	IPIGSNGTLV TLEPTRFLP EKLSIQIEAV
HMGRcInstaIw{dictyostez}		
HMGRcInstaIw{wheat1}		
HMGRcInstaIw{rice}	D.	
HMGRcInstaIw{corn}	DEDFLVGS	G.
HMGRcInstaIw{wheat3}		
HMGRcInstaIw{wheat2}		
HMGRcInstaIw{soybean}		
HMGRcInstaIw{rubbertree3}	D.SWDVEE	Y.
HMGRcInstaIw{rosypertiwi}	E.GWEIEE	
HMGRcInstaIw{tomato}	D.SWDE.	
HMGRcInstaIw{woodcobacc}	DECDWEED	E.
HMGRcInstaIw{potato}	D.SWDIED	E.
HMGRcInstaIw{radish}	D.SGDSER	
HMGRcInstaIw{arabadopstis1}	D.AWDLAD	T.
HMGRcInstaIw{cucumismel}	D.AWDLAD	
HMGRcInstaIw{rubbertree2}		
HMGRcInstaIw{rubbertree1}	D.VWDLAD	T.
HMGRcInstaIw{camptothec}	PDVWGVD	DE.
HMGRcInstaIw{arabadops2}	PDVWVNDG	
HMGRcInstaIw{chineseham}	PSVSLWQFYL	SKMISMIDIEQ VVTLISLAFLT AVKIYFFEQA

FIG. 32T

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HMGRclustalw{chinese2}	ET..ESTLSL	HMGRclustalw{syrianhamst}	PSVSLWQFYL SKMISMDIEQ VVTLIAFL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{rat}	PSVSLWQFYL SKMISMDIEQ VVTLIAFL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{rabbit}	PSVSLWQFYL SKMISMDIEQ VVTLIAFL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{human}	PSVSLWQFYL SKMISMDIEQ VVTLIAFL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{mouse}	PSVSLWQFYL SKMISMDIEQ VVTLIAFL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{kenopus}	PSVSLWQFYL SRVMTDVEQ IITLGLALL AVKYIFFEQ	ET..ESTLSL	HMGRclustalw{sea urchin}	ATYPERVSI	PTMPLWEEYA TRVWPPPLDY ILTALATV AVHYIFFSD	HMGRclustalw{cockroach}	EE..LPTVRL	EE..LPTVRL	HMGRclustalw{drosophila}	ESGEIADIII KWL.TMSADH IVISIVLIAL VKKICFDNR	HMGRclustalw{dictyostel}	DP..LPDQL	HMGRclustalw{schistosom}	CHYKCMSTTF VIFVSLIIH LNNRYSERIS SFKHNSSENE	HMGRclustalw{archaeoglo}	VFPLVHITA	HMGRclustalw{pseudomonas}	Consensus	PSDSLWDFY - SKMISMDIEQ VVTLIA - LT AVKYIFFED - RT--	ESTLSL
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HMGRClustalW{methanobac}.....
 HMGRClustalW{methanococ}.....
 HMGRClustalW{halobacter}.....
 HMGRClustalW{sulfolobus}.....
 HMGRClustalW{yeast2}.....
 HMGRClustalW{yeast1}.....
 HMGRClustalW{phycomyces}.....
 HMGRClustalW{fusarium}.....
 HMGRClustalW{candida}.....
 HMGRClustalW{dictyostez}.....
 HMGRClustalW{wheat1}.....
 HMGRClustalW{rice}.....
 HMGRClustalW{corn}.....
 HMGRClustalW{wheat3}.....
 HMGRClustalW{wheat2}.....
 HMGRClustalW{soybean}.....
 HMGRClustalW{rubbertre3}.....
 HMGRClustalW{rosypertiwi}.....
 HMGRClustalW{tomato}.....
 HMGRClustalW{woodtobacc}.....
 HMGRClustalW{potato}.....
 HMGRClustalW{radish}.....
 HMGRClustalW{arabadopis1}.....
 HMGRClustalW{cucumismel}.....
 HMGRClustalW{rubbertre2}.....
 HMGRClustalW{rubbertrel}.....
 HMGRClustalW{campctothec}.....
 HMGRClustalW{arabadopis2}.....
 HMGRClustalW{chineseham}.....
 KM.PITSPV VTPKCAPDNC CRREPLTVRR SEKLSVVEEE

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FIG. 32U

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FIG. 32v

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HMGRClustalW(chinese2az}	KN..PITSPV VTPKAPDNC CRREPLTVRR SEKLSVVEEB
PGVSQDRKVE	
HMGRClustalW(syrianhamst}	KN..PITSPV ATPKAPDNC CRREPLTVRR NEKLSVVEEB
PGVNQDRKVE	
HMGRClustalW}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
PGVNQDRKVE	
HMGRClustalW}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
AGMSQDRKVE	
HMGRClustalW}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
human}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
mouse}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
HMGRClustalW}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
xenopus}	KN..PITSPV VTPKKAQDNC CRREPLTVRR NQKLSVVEED
S..SKEETEA	
HMGRClustalW(sea urchin}	MEGHEVVNPG SDHEDASEVE TIGTLSSSPS TSDVRVISM
TSRTQACQTD	
HMGRClustalW}	VTGDSVVNSN STDAQHLHY IMRWLTV..S ADHIVILITL
LATAVKKVEFF	
HMGRClustalW(drosophila}	RQ...SGPV AIEAKASQTT PIDEHVE...QEKD
TENSAAVRTL	
HMGRClustalW(dictyostel}	YEVTISIFHEI YNIFHVINAN LVVYFLGLF LFKRIRLNKP
INSQLRNLNI	
HMGRClustalW(schistosom}	YEVTISIFHEI YNIFHVINAN LVVYFLGLF LFKRIRLNKP
HMGRClustalW}	
HMGRClustalW(pseudomonas}	
Consensus	KN--PITSPV VT-KKAPDNC CRREPLTVRR --K-SSVEEE.-G-
SQDRKVE	

HMGRclustalw{methanobac}
 HMGRclustalw{methanococ}
 HMGRclustalw{halobacter}
 HMGRclustalw{sulfolobus}
 HMGRclustalw{yeast2}
 HMGRclustalw{yeast1}
 HMGRclustalw{phycomyces}
 HMGRclustalw{fusarium}
 HMGRclustalw{candida}
 HMGRclustalw{dictyostez}
 HMGRclustalw{wheat1}
 HMGRclustalw{rice}
 HMGRclustalw{corn}
 HMGRclustalw{wheat3}
 HMGRclustalw{wheat2}
 HMGRclustalw{soybean}
 HMGRclustalw{rubbertre3}
 LSLPTKIHAP
 HMGRclustalw{rosyperiwi}
 KIAFVVPQGP
 HMGRclustalw{tomato}
 QIAPMAPQGP
 HMGRclustalw{woodtobacc}
 QIVPMVPQGP
 HMGRclustalw{potato}
 KIAPMVPQGP
 HMGRclustalw{radish}
 QIVAALPNP
 HMGRclustalw{arabadops1}
 IVSVALPNP
 HMGRclustalw{cucumisamel}
 VALPSKVDA
 HMGRclustalw{rubbertre2}

 HMGRclustalw{rubbertre1}
 IAAPTICLPTS
 HMGRclustalw{campthec}
 PIKPKVDPV
 HMGRclustalw{arabadops2}
 PIKPNVDPP
 HMGRclustalw{chineseham}
 RTQLEIELP

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FIG. 32W

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FIG. 32X

HMGRClustalW{chinese2}	VIKPLVETE SAS.....	RATVLG.A	SGTSPVAA
RTQELIPL	VIKPLVETE STS.....	RATVLG.A	SGGCSVAL
GTQELIPL	VIKPLVETE TSG.....	RATVLG.A	SAASPVAL
GAQEPGIELP	VIKPLVETE SPH.....	RAAFVWGS	SFPDLSVL
ETKEPEIELP	VIKPLVETE TPN.....	RATFVWGS	SLDTSVL
VTQELIPL	VIKPLVETE P.....	KAKFIVG..	DSSPLISP
HMGRClustalW{mouse}	VIKPLVETE P.....	KAKFIVG..	DSSPLISP
EDKNTMFLP	VIKPLVETE P.....	KAKFIVG..	DSSPLISP
HMGRClustalW{sea urchin}	PVTASPRNSR SSSPVSSHV	KPARFTIGSS	GGSEDEEEE
VIKEEVEWV	ETRDLELTTTR GMDG.....	W	VEVSSPVEHK
APQPLEPP	ETRDLELTTTR GMDG.....	W	VEVSSPVEHK
HMGRClustalW{cockroach}	ETRDLELTTTR GMDG.....	W	VEVSSPVEHK
APQPLEPP	ETRDLELTTTR GMDG.....	W	VEVSSPVEHK
HMGRClustalW{drosophila}	LFTIEDQSSA N.....	ASTQTDLL	
PLRHRVGP	LFTIEDQSSA N.....	ASTQTDLL	
HMGRClustalW{dictyostel}	.....	SGKEQ EQ.....	.....
QOTPDITNQP	.....	SGKEQ EQ.....	.....
HMGRClustalW{schistosom}	PKIKETLISD QVKQSPVLPK	FSKQNDIPL	QSRKRIYCLH
KDDYIDRND	PKIKETLISD QVKQSPVLPK	FSKQNDIPL	QSRKRIYCLH
HMGRClustalW{archaeoglo}	.....	
HMGRClustalW{pseudomonas}		
Consensus	VIKPLVETE	-S-----	-RATFV-G-A -SA-PPPA -I-
ppEILP			

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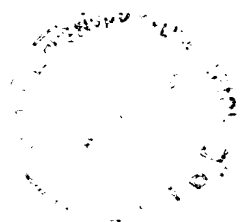
DEEIIKLVA	Consensus	SE-----PRP-N EECLOI---	AEKGAKSL
HMGRclustalw{chinese2}	SE.....PRP.N EECLOILE..	SAEKGAKFLS	
DAEIIQLVNA	HMGRclustalw{syrianhamst}	SE.....PRP.N EECLOILE..	SAEKGAKFLS
DAEIIQLVNA	HMGRclustalw{rat}	SE.....PRP.N EECLOILE..	SAEKGAKFLS
DAEIIQLVNA	HMGRclustalw{rabbit}	KE.....PRP.N EECLOILG..	NAEKGAKFLS
DAEIIQLVNA	HMGRclustalw{human}	RE.....PRP.N EECLOILG..	NAEKGAKFLS
HMGRclustalw{mouse}	.....	
HMGRclustalw{xenopus}	EE.....PRP.L DECVRIK..	NPDKGAQYLT	
DAEIVISLVNA	LEF.....ELKAPRP.M PELTEIL..	NVGKGPNAIT	
DDEVQLLVGA	AS.....NRS.I DECLSVC...	KSDVGAQALS	
DCEVMALVTS	KP.....PRP.V QECLOILNST	EEGSGPAALS	
DEEIVSIVHA	TKTN.....	.KKIPIKELS	
NEEIIKILEK	SSSVSTFSNT CKNSNERPSN	VLDLDMLTEK	IKOGLGHELS
DTEIIQLTSH	HMGRclustalw{schistosom}		
HMGRclustalw{archaeoglo}	.....	
MOVLRLDRR	HMGRclustalw{pseudomonas}	.....

FIG. 32AA

Accession	Species	Gene	Protein	Accession	Species	Gene	Protein
GR. ICLYEI	E. RHVPVDEA	VRIRREIE	GR. RTGVR	HMGRClustalW	{methanobac	LEHVSNTS	..
GE. IKPYOL	D. KMFGSKIA	TEIRRKIE	GE. KKGIE	HMGRClustalW	{methanococ	..FKHICNTS	..
GD. LRHEL	E. AHADADTA	AEARLIVE	..SQSGAS	HMGRClustalW	{halobacter	..IDAVGNYG	..
GE. ISFHEV	D. NLLLEANAA	MVARLALAE	..KIVGVG	HMGRClustalW	{sulfolobus	..LPSIGSTV	..
G. KLPLYAL	EKKLEDDTTA	VLVRKALST	LAESPILVS	HMGRClustalW	{yeast2	..EKLPRFN	..
G. KLPLYAL	EKKLGDTTA	VAVRKALSI	LAEPVLAS	HMGRClustalW	{yeast1	..DRLPYKN	..
G. KIPGYAL	EKITLGDFTTA	VKIRRSIAR	NKKAADITHS	HMGRClustalW	{fusarium	..LDRSKLPHYEN	..
G. KLPLYAL	EKQLGDNLRA	VAIRRKALSD	LADAPVLRS	HMGRClustalW	{candida	..NKLPLYLH	..
A. WVAAEK	AATSGEDPSS	IQPVVPPTSN	LDPEGSLTN	HMGRClustalW	{dictyostez	..LPVDH	..
G. ALPSHRL	ESRLGDCCRRA	ARLRREALR	..RVTGRG	HMGRClustalW	{wheat1	..	..
G. KVPYSAL	EARLGDCCRRA	AGIRREALR	..RITGRD	HMGRClustalW	{wheat3	..IEGLPLDG	..
HMGRClustalW	{wheat2	..	..	HMGRClustalW	{wheat3	..	..
HMGRClustalW	{soybean	..	..	HMGRClustalW	{wheat2	..	..
HMGRClustalW	{rubbertree3	..	..	HMGRClustalW	{rubbertree3	..	..
HMGRClustalW	{tomato	..	..	HMGRClustalW	{tomato	..	..
HMGRClustalW	{woodtobacc	..	..	HMGRClustalW	{woodtobacc	..	..
HMGRClustalW	{potato	..	..	HMGRClustalW	{potato	..	..
HMGRClustalW	{radish	..	..	HMGRClustalW	{radish	..	..
HMGRClustalW	{arabidopsi1	..	..	HMGRClustalW	{arabidopsi1	..	..
HMGRClustalW	{cucumismel	..	..	HMGRClustalW	{cucumismel	..	..
HMGRClustalW	{rubbertree2	..	..	HMGRClustalW	{rubbertree2	..	..
HMGRClustalW	{rubbertree1	..	..	HMGRClustalW	{rubbertree1	..	..
HMGRClustalW	{campthohec	..	..	HMGRClustalW	{campthohec	..	..
HMGRClustalW	{arabadop2	..	..	HMGRClustalW	{arabadop2	..	..
HMGRClustalW	{chineseham	..	..	HMGRClustalW	{chineseham	..	..

FIG. 32BB

HMGRClustalW{chinese2}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS	Consensus	G---IPSYSL ESKLGDCKRA VSIRREALSK K--LRITGSS --
HMGRClustalW{syrianhamst}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{rat}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{rabbit}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{human}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{mouse}	.....	
HMGRClustalW{xenopus}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{sea urchin}	K. HIPIAYKL ETLMEETHERG VSIRQTLST K. LPESS		
HMGRClustalW{cockroach}	G. HIAGYQL EKVRNPERG VSIRQTLST K. LPESS		
HMGRClustalW{drosophila}	GGTHCPHLKI ESVDPPERG VSIRQTLST K. LPESS		
HMGRClustalW{dictyostel}	G. EVLAYRL ENELGDCSRA VEIRRMLEK ... QLSKK		
HMGRClustalW{schistosom}	G. RLKTRREL ESVRNPERG VSIRQTLST K. LPESS		
HMGRClustalW{archaeoglo}	HYKSGKIRRA MSSRIPIGYK LSVEERTKQV AEFAGLSDEE		
HMGRClustalW{pseudomonas}	.....MS LDSRLPAFRN LSPAARLDHI GQLGLSHDD		
..VSLANAG			



750
 HMGRclustalW{methanobac
 VPLATSEGAL
 HMGRclustalW{methanococ
 IPLATTEGAL
 HMGRclustalW{halobacter
 FPAEAE.S.A IENMVGSIQV PMGVA GPVSV DGGSVAGEKY
 IDEEMAMKKK IENMIGAIGI PLGFA GPLKI NGEYAKGEFY
 IDMERASRRN IENPIGVQI PLGVA GPLRV RGEHADGEFY
 701
 HMGRclustalW{yeast1
 YDYDRVFGAC CENVIGYMPI PVGVIGPLVI DGT...SYH
 HMGRclustalW{yeast2
 YDYDRVFGAC CENVIGYMPI PVGVIGPLII DGT...SYH
 HMGRclustalW{sulfolobus
 IDYSEIKKKK AENVIGAIGI PLGIVGPIRV NGDYAKGDFY
 VPMATTEGAL
 HMGRclustalW{yeast1
 YDYDRVFGAC CENVIGYMPI PVGVIGPLVI DGT...SYH
 HMGRclustalW{yeast2
 YDYDRVFGAC CENVIGYMPI PVGVIGPLII DGT...SYH

FIG. 32CC

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Accession	Gene	Species	Accession	Gene	Species
IPMATTEGCL	HMGRCLUSTALW{phycomycetes}		IPMATTEGCL	IPMATTEGCL	
IPMATTEGCL	HMGRCLUSTALW{fusarium}	YNMERFFGAC	CENVIGYMPL	PVGAGAPLVI	DGQ...SYF
IPMATTEGCL	HMGRCLUSTALW{candida}	YDYDRVFGAC	CENVIGYMPL	PVGAGAPLII	DGK...PYH
IPMATTEGCL	HMGRCLUSTALW{dictyostez}	FDYTKVLGAC	CENVIGYIFI	PVGAGAPLIT	DGK...LVS
IPMATTEGCL	HMGRCLUSTALW{wheat1}				
IPMATTEGCL	HMGRCLUSTALW{rice}	MDYQAILGQC	CEMPVGYYQL	PVGAGAPLIT	DGR...EXH
IPMATTEGCL	HMGRCLUSTALW{corn}	FDYASITLQC	CELPVGYYQL	PVGAGAPLIT	DGR...RFY
IPMATTEGCL	HMGRCLUSTALW{wheat3}				
IPMATTEGCL	HMGRCLUSTALW{wheat2}				
HMGRCLUSTALW{soybean}					
HMGRCLUSTALW{rubberre3}		FDYESITLQC	CEMAIGYYQL	PVGAGAPLIT	DGK...EYT
IPMATTEGCL	HMGRCLUSTALW{rosyperiwi}	FDYASITLQC	CEMPVGYYQL	PVGAGAPLIT	DGR...EYM
IPMATTEGCL	HMGRCLUSTALW{tomato}	FNYESITLQC	CEMPIGYYQL	PVGAGAPLIT	NGK...EFS
IPMATTEGCL	HMGRCLUSTALW{woodobacc}	FDYESITLQC	CEMPVGYYQL	PVGAGAPLIT	DGR...EYS
IPMATTEGCL	HMGRCLUSTALW{potato}	FDYSSITLQC	CEMPVGYYQL	PVGAGAPLIT	DGR...EYS
IPMATTEGCL	HMGRCLUSTALW{radish}	FDYDSITLQC	CEMPVGYYQL	PVGAGAPLIT	DGY...EYS
IPMATTEGCL	HMGRCLUSTALW{arabadopts1}	FDYESITLQC	CEMPVGYYQL	PVGAGAPLIT	DGY...EYS
IPMATTEGCL	HMGRCLUSTALW{cucumisme1}	FDYESITLQC	CEMPVGYYQL	PVGAGAPLIT	DGF...EYT
IPMATTEGCL	HMGRCLUSTALW{rubberre2}				
HMGRCLUSTALW{rubberre1}		FDYESITLQC	CEMPVGYYQL	PVGAGAPLIT	NGR...EYS
IPMATTEGCL	HMGRCLUSTALW{camptothec}	FDYDSITLQC	CEMPVGYYQL	PVGAGAPLIT	DGR...EYS
IPMATTEGCL	HMGRCLUSTALW{arabadopts2}	FDYNSITLQC	CEMPVGYYQL	PVGAGAPLIT	DGV...EYS
IPMATTEGCL	HMGRCLUSTALW{chineseham}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DGK...EYQ
IPMATTEGCL	HMGRCLUSTALW{chinesehez}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DGK...EYQ
IPMATTEGCL	HMGRCLUSTALW{syrriahamst}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DGK...EYQ
IPMATTEGCL	HMGRCLUSTALW{rat}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DGK...EYQ
IPMATTEGCL	HMGRCLUSTALW{rabbit}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DGK...EYQ
IPMATTEGCL	HMGRCLUSTALW{human}	YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	DEK...EYQ
IPMATTEGCL	HMGRCLUSTALW{mouse}				
HMGRCLUSTALW{xenopus}		YNYSITLWGAC	CENVIGYMPI	PVGAGAPLIT	NNK...EYQ

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[illegible]

VASTNRGCR	IGLGGASSR	VLADGMT	RG	PVRLPRACD	HMGRclustalw(chinese2	SAEVKAWLET	HMGRclustalw(syrianhamst	SAEVKAWLET	SAEVKAWLET	SAEVKSWLET	HMGRclustalw(rac	VASTNRGCR	ISLGGASSR	VLADGMT	RG	PVRLPRACD	VASTNRGCR	ICLGGASSR	VLADGMT	RG	PVRLPRACD	VASTNRGCR	IGLGGASSR	VLADGMT	RG	PVRLPRACD	VASTNRGCR	human	SAEVKAWLET	HMGRclustalw(mouse	HMGRclustalw(xenopus	VASTNRGCR	IMLGGAKSR	VLADGMT	RG	PVRLPRACD	VASTNRGCR	IRSAAGIHSV	LIGDGMT	RG	PLVRLPSAQE	VASTNRGCR	LMRCG	VTSR	IVADGMT	RG	PVRLPNIDR	VASTNRGCR	LSVRG	VRSV	VEDVGMT	RG	PCVRFPSVAR	VASTNRGCR	ITSSGAKCT	ITSRGMT	RG	PVRFPSDIVK	VASTNRGCR	IFLAGGIKSV	VYRDQMT	RG	PVWFPSIID	VAAASNAARM	ARESGGFTTD	YTGSLMIGOI	QVTKLTPNA	VAAASYMAD	ARANGGFTTS	SSAPLMHAQV	QIVGIQDPLN	VASTNRGCR	I-LSGGATSV	VLADGMT	RA	PVRFPPSAKR	Consensus	AAELKEWLED
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FIG. 3266

850	HMGRclustalw{methanobac}	NM.DATRE AESTRHGKL VKIDPI....	IAGSYVYPR
	FVTTGDSMG		
	HMGRclustalw{methanococ}	NF.ERIKAV AESTTRHGKL IKIEPI....	LIVGRNLYPR
	FVEKTTGDSMG		
	HMGRclustalw{halobacter}	NF.AATKEA AEETTRHGKL LDVTP....	YVGNVLYPR
	FRYDTGDSMG		
	HMGRclustalw{sulfolobus}	NL.EKIRNI ANSTSHHGKL KSITP....	FVLGNVWLYR
	FSFETGDSMG		
	HMGRclustalw{yeast2}	EEGQNSIKKA FNSTSRFARL QHIQT....	CLAGDLLFMR
	FRITTTGDSMG		
	HMGRclustalw{yeast1}	EEGQNAIKKA FNSTSRFARL QHIQT....	CLAGDLLFMR
	FRITTTGDSMG		
	HMGRclustalw{phycomycetes}	EG.NDIVTNA FNSTSRFARL RKLKI....	ALAGLVFIR
	FSITTTGDSMG		
	HMGRclustalw{fusarium}	EAGQDMMKKA FNSTSRFARL QSMKT....	ALAGTNLYIR
	FKITTTGDSMG		
	HMGRclustalw{candida}	DEGQEEEMKKA FNSTSRFARL QHLOT....	ALAGDLLFIR
	FRITVTGDSMG		
	HMGRclustalw{dictyostez}	QENFYQVASA FNSTSRFARL KSIKV....	VIAGRLVLYR
	FKSSTGDSMG		
	HMGRclustalw{wheat1}	.....	.....
	.....GDAMG		
	HMGRclustalw{rice}	PANFELLAAV FNRSSRFARL QDIRC....	ALAGRNLYMR
	FSCITGDSMG		
	HMGRclustalw{corn}	PANFDTLSV FNRSSRFARL QGVQC....	AMAGRNLYMR
	FSCSTGDSMG		
	HMGRclustalw{wheat3}	.....	.....
	.....GDAMG		
	HMGRclustalw{wheat2}	.....	.....
	.....GDAMG		
	HMGRclustalw{soybean}	.....	.....
		
	HMGRclustalw{rubbertre3}	PDNFDTIAV FNRSSRFARL QSVQC....	ALAGKNLYMR
	FSCSTGDSMG		
	HMGRclustalw{rosypertwi}	TQNFETISV FNRSSRFARL QSVQC....	ALAGKNLYIR
	FSCSTGDSMG		
	HMGRclustalw{tomato}	PIKEESLANV FNRSSRFARL QRIQC....	ALAGKNLYMR
	LCCSTGDSMG		
	HMGRclustalw{woodtobacc}	PVKFETLAAV FNRSSRFARL QRIQC....	ALAGKNLYMR
	FVCCSTGDSMG		
	HMGRclustalw{potato}	PLNFETLSLM FNRSSRFARL QGIQC....	ALAGKNLYIT
	FSCSTGDSMG		
	HMGRclustalw{radish}	PENFETLAV FNRSSRFARL QVVMC....	TLAGKNAYVR
	FSCSTGDSMG		
	HMGRclustalw{arabadopais1}	PENFDTIAV FNRSSRFARL QSVKC....	TLAGKNAYVR
	FCCSTGDSMG		
	HMGRclustalw{cucumisamel}	PSNFDTIAV FNRSSRFARL QSIRC....	SIAGKNLYVR
	FCCSTGDSMG		
	HMGRclustalw{rubbertre2}	.....	.....
		
	HMGRclustalw{rubbertre1}	PDNFDTIAV FNRSSRFARL QGIKC....	SIAGKNLYIR
	FSCSTGDSMG		
	HMGRclustalw{campctothec}	PLNFETLAAV FNRSSRFARL QNIKC....	ALAGKNLYMR
	YSCSTGDSMG		
	HMGRclustalw{arabadop2}	PSNFERTSLI FNRSSRFARL QSITC....	TIAGRNLYPR
	FACSTGDSMG		
	HMGRclustalw{chineseham}	PEGFAVIKDA FDTSRFARL QKLHV....	TMAGRNLYIR
	FQSKTGDAMG		

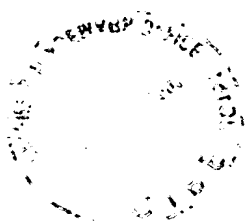


FIG. 32II

HMGRclustalw{chinese2}	PEGFAVIKDA	FDSTSRFARL	QKLV.....	TMAGRNLYIR	
FQSKTGDMG	HMGRclustalw{syrhanhamst}	PEGFAVIKDA	FDSTSRFARL	QKLV.....	TMAGRNLYIR
FQSKTGDMG	HMGRclustalw{rat}	PEGFAVVKEA	FDSTSRFARL	QKLV.....	TLAGRNLYIR
LQSKTGDMG	HMGRclustalw{rabbit}	PEGFAVIKDA	FDSTSRFARL	QKLV.....	SMAGRNLYIR
FQSKTGDMG	HMGRclustalw{human}	SEGFAVIKDA	FDSTSRFARL	QKLV.....	SIAGRNLYIR
FQSRSGDMG	HMGRclustalw{mouse}	.....	.....	.....	.....
FQSKTGDMG	xenopus	AEGFKVIKDA	FDSTSRFARL	GRLQN.....	CVAGRNLYIR
FQALTGDMG	HMGRclustalw{sea urchin}	PENFAAIKER	FESTSRFAKL	KSIQT.....	ALAGRYMFLR
FQALTGDMG	HMGRclustalw{cockroach}	PYNFEQIKGN	FDSTSRFARL	SKIH.....	RVAGRHLYIR
FVALTGDRMG	HMGRclustalw{drosophila}	DENYRVVKT	FDSTSRFARL	KDCHI.....	AMDGPQLYIR
EKCDDTGDMG	HMGRclustalw{dictyostel}	TDNYQATKAV	FDSTSRFARL	SAIKC.....	TIAGRSVYIR
FQARTGDAMG	HMGRclustalw{schistosom}	EEGFQTLKSA	FDKTSAHVNL	LSVFA.....	CPAGRYIHIR
LIVDKDAMG	HMGRclustalw{archaeoglo}	EIERANEC	PMLVNLGGC	KDIEAR	VID TIMGKMLIVH
HMGRclustalw{pseudomonas}	EIEELANRKO	QLNLSLGGC	RDIEVHTFAD	TPRGPMVLVAH	
FSCSTGDAMG	Consensus	PENFETLK-A	FNSTSRFARL	QSIQC-----	AIAGRNLYIR

NADH binding domain 1

(continued)

NADH binding domain 1



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PAAVNWIEGR		Consensus	MNMVSKGVEH VL--LQED-- -GFPMDDVIS ISGNYYCTDKK
EMGRClustalw{chinese}PAAINWIEGR			
EMGRClustalw{syrhammast}			
EMGRClustalw{rat}			
EMGRClustalw{rabbit}			
EMGRClustalw{human}			
EMGRClustalw{mouse}			
EMGRClustalw{xenopus}			
EMGRClustalw{sea urchin}			
EMGRClustalw{cockroach}			
EMGRClustalw{drosophila}			
EMGRClustalw{dictyostel}			
EMGRClustalw{schistosom}			
EMGRClustalw{archaeoglo}			
KAVFDKDVIG			
HMGRCIustalw{pseudomonas}			
QVRITPPGLE			

950
 HMGRCJLUSTALW{methanobac} AG.SMG.FN
 HMGRCJLUSTALW{methanococ} GKSIVAEVFL TEKEVNKKYLLK TTSQAIABVN RLKQYIGSAI
 GRSVTADVRI PREVEERLH TTPERGRELN TRKMLVGSAX
 GKTVLAEALI KQDVIRNLIH SNAQLIHIDIN LRKWLGTAR
 HMGRCJLUSTALW{yeast2} AG.SVGGFN
 HMGRCJLUSTALW{yeast1} GKSVAEATI PGDVVRKVLK SDVSATVELN IAKMLVGSAM
 HMGRCJLUSTALW{phycomyces}
 HMGRCJLUSTALW{fusarium} GKGVAEALI PGVVRSVLK SDVDSLVELN VAKMLIGSAM
 AG.SVGGFN
 HMGRCJLUSTALW{candida} GKSVAEASI PKDAVVKVLK SSVKAVDVN VNKMLIGSAM
 AG.SVGGFN
 HMGRCJLUSTALW{dictyostez} GKSVAEAVI SGDIVRDLK TTEALVSLN IDKMLIGSAM
 AG.SIGGFN
 HMGRCJLUSTALW{wheat1} GKSVAEATI KGRWQSVID TTEKLVLEIN IIKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{rice} GKSVAEALI KGDVQKVLK TTEKLVLEIN IIKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{corn} GKSVAEAVI GEEVVKVLK TDVQSLVELN TIKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{wheat3} GKSVAEAVI REELLKVLK TNVQSLVELN VIKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{wheat2} GKSVAEALI REEVEKVLK TNVQSLVELN VIKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{soybean}LK TNVSATVELN MLKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{rubbertree3} GKSVAEALI KEEVVKVLK TNVAATVELN MIKMLTGSAY
 AG.SIGGFN
 HMGRCJLUSTALW{rosypertiwi} GKSVAEALI KEEIVKTVLK TEVAALIELN MVKMLAGSAI
 AG.ATGGFN
 HMGRCJLUSTALW{tomato} GKSVAEALI TEEVVKVLK TEVAATVELN MLKMLTGSAM
 AG.ATGGFN
 HMGRCJLUSTALW{woodtobacc} GKSVAEALI TEEVVKVLK TEVAATVELN MLKMLTGSAM
 AG.ATGGFN
 HMGRCJLUSTALW{potato} GKSVAEALI KEEVVKVLK TEVAATVELN MLKMLTGSAM
 AG.ATGGFN
 HMGRCJLUSTALW{radish} GKSVAEAVI RGETVNKKVLK TSVASLVELN MLKMLTGSAI
 AG.SIGGFN
 HMGRCJLUSTALW{arabadopsis1} GKSVAEAVI RGEIVNKKVLK TSVAATVELN MLKMLAGSAY
 AG.SIGGFN
 HMGRCJLUSTALW{cucumismel} GKSVAEAVI KDEVVRKVLK TSVASLVELN MLKMLTGSAM
 AG.ATGGFN
 HMGRCJLUSTALW{rubbertree2} GKSVAEALI KEEVVKVLK TDVALLVELN MLKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{rubbertree1} GKSVAEALI KEEVVKVLK TNVASLVELN MLKMLAGSAY
 AG.ATGGFN
 HMGRCJLUSTALW{campothec} GKSVAEAVI KEEVVKVLK TNVASLVELN MLKMLTGSAM
 AG.ATGGFN
 HMGRCJLUSTALW{arabadops2} GKHVCEAFI KAEIVKVLK TSVEATVELN TLKMLVGSAM
 AG.SIGGFN
 HMGRCJLUSTALW{chineseham} GKTVVCEAVI PAKVREVLK TTTTEAMIDVN INKMLVGSAM

101621" 62458860

FIG. 32MM

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AG.SIGYN	HMGRclustalW{chineseaz}	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{syrianhamst}	GKTWCEAVI PARVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{rat}	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{rabbit}	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{human}	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{mouse}	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM
AG.SIGYN	HMGRclustalW{kenopus}	GKTWCEAVI PAKVREVLK SSTBALVEVN INKLVGSAM
AG.SIGYN	HMGRclustalW{sea urchin}	GKTWCEAVI PAHIQVLK TSASALVDLN IHKLVGSAM
AG.SIGYN	HMGRclustalW{cockroach}	GKTWCEAVI PADIKSVLK TSQALMDVN ITKLVGSAM
AG.SIGYN	HMGRclustalW{drosophila}	GKTWCEAVI SAATLRVLK TDAKTIVECN KLVGMGSAM
AG.SIGYN	HMGRclustalW{dictyostel}	GKTWCEAVI TGDVQVLK TNQALVDLN IAKLVGSAM
AG.SIGYN	HMGRclustalW{schistosom}	GKTWCEAVI SADVLQVLH TNAQRLARLT HSKWIGSAM
AGCPGMMGCN	HMGRclustalW{archaeoglo}	LM.....GEEV EGIMLAYAFA AADPFRCATH NKGIMNGISA
LM.....	HMGRclustalW{pseudomonas}	TAFFSGEAVI EGILDAYAFA AVDPYRAATH NKGIMNGIDP
LI.....	Consensus	GKTWCEAVI PAKVREVLK TTTEAMIDVN INKLVGSAM AG--
SLGFFN		

K

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FIG. 3200

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.....EDLYI	HMGRClustalW{chinese2}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{syrhamst}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{rat}	LHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{rabbit}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{human}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{mouse}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEASGPTN..
.....EDLYI	HMGRClustalW{xenopus}	AHAAIVTAL	YIACGQDAAQ	NVGSSNCITL	MEATGPTY..
.....EDLYI	HMGRClustalW{sea urchin}	AHAAIVTAL	YIATGQDAAQ	NIASSNCMTL	METRGPKG..
.....GDLYL	HMGRClustalW{cockroach}	AHAAIVTAL	FIATGQDPAQ	NVGSSNCMTL	MEPWGEDG..
.....KDLV	HMGRClustalW{drosophila}	AHAAIVTAL	FIATGQDPAQ	NVTSSNCSTA	MECWAENS..
.....EDLYM	HMGRClustalW{dictyostel}	AHAAIVTAL	FIATGQDCAQ	NVSSNCITQ	MEACNDG...
.....QDLXI	HMGRClustalW{schistosom}	AHAAIIAGM	FAATGQDLAQ	VDBSSCLTQ	LEVDLSD...
.....DSLVA	HMGRClustalW{archaeoglo}	.....	IATGNDPRA	IEAGAHSYAA	IGG.YKPLTT
.....YEVDRKGNLV	HMGRClustalW{pseudomonas}	.....	VATGNDWRA	VEAGAHAYAC	RSGHVGSLLT
.....MEKDNNGHLV					
Consensus	AHAAIVTAL	FIATGQDPAQ	NVSSNCITM	MEAVNDGN	-----

D

1050
 HMGRclustalw(methanobac)
 RVHAFAEIVG
 HMGRclustalw(methanococ)
 SVTLPDVPIG TVGGGTRVET QKECLEMLGC YBDN.....
 SVSIASLEVG TVGGGTRKLP QSEGLDILGV SGGGDP.AGS
 NADALAE CIA
 HMGRclustalw(sulfolobus)
 SVTLPSLEVG TVGGGTRLP QKEALSIMGV YGSGNP.PGS
 NADALAE CIA
 HMGRclustalw(yeast2)
 SVSMPSEVG QGAMLDLLGV RGPHPTEPGA
 HMGRclustalw(yeast1)
 SVSMPSEVG QGAMLDLLGV RGPHPATAPGT
 HMGRclustalw(phycomycetes)
 SVSMPSEVG QGAMLDLLGV RGSHPPTNPGD
 NARPLARIIG
 HMGRclustalw(candida)
 SVSMPSEVG TIGGGTILDP QGSMLELLGV RG.PADVPGE
 NARQLAKIYA
 HMGRclustalw(dicystose2)
 SVTMPSEVG TVGGGTHLPA QSACLDLLKI RGANLERPGA
 NSEQLARVVA
 HMGRclustalw(wheat1)
 SVTMPPIEV.....
 HMGRclustalw(rice)
 SVTMPSEVG TIGGGTCLAS QACILNLLGV KGSNHGSPGA
 HMGRclustalw(corn)
 SVTMPSEVG TVGGGTQLAS QSACLDLLGV RGSRDPRPGS
 NARLATVVA
 HMGRclustalw(wheat3)
 SVTMPPIEV.....
 HMGRclustalw(wheat2)
 SVTMPPIEV.....
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASKZSPGS
 SVSMPSEVG TVGGGTQLAS QSACILNLLGV KGASKDPSGS
 NSRLTATIA
 HMGRclustalw(rubbertre3)
 SVSMPSEVG TVGGGTQLAS QSACILNLLGV KGASKDPSGS
 NSRLTATIA
 HMGRclustalw(rosypertwi)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASKDPSGA
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGANREAPGS
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGANREVPGS
 NARLATVVA
 HMGRclustalw(woodtobacc)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGANREVPGS
 NARLATVVA
 HMGRclustalw(potato)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGANRDAPGS
 NARLATVVA
 HMGRclustalw(radish)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASKESPGM
 NSRLTATIA
 HMGRclustalw(arabadopis1)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASTESPGM
 NARLATVVA
 HMGRclustalw(cucumis mel)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASKESPGA
 NSRLTATIA
 HMGRclustalw(rubbertre2)
 SVTLPSEVG TVGGGTQLAS QSACILNLLGV MGACKESPGS
 YSRLLTATIA
 HMGRclustalw(rubbertre1)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGANKESPGS
 NSRLTATIA
 HMGRclustalw(campthec)
 SVTMPSEVG TVGGGTQLAS QSACILNLLGV KGASKAPGS
 NARLATVVA
 HMGRclustalw(arabadop2)
 SVSMPSEVG TVGGGTQLAS QSACILNLLGV KGSNNKPPGS
 NAQOLARIYA
 HMGRclustalw(chinese ham)
 SCTMPSEVG TVGGGTNLTP QACILQMLGV QGACKDNPPGE
 NARQLARIYA

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FIG. 32PP



FIG. 3200

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HMGRClustalW(chinese)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(syrianhamst)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(rat)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(rabbit)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(human)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(mouse)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(xenopus)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(sea urchin)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(cockroach)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(drosophila)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(dicystosom)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(schistosom)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
HMGRClustalW(pseudomonas)	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE
Consensus	SCTMPSEIEG TVGGGTNLTP QACIQMLGV QGACKDNPGE

NADH binding domain 2

1100	HMGRclustalw{methanobac}	GAVALAGELSL MGALAAAGHLA RAHSELGRG	.....
	HMGRclustalw{methanococ}	AAVALAGELSL LGALAAAGHLG KAHQELGR	.....
	HMGRclustalw{halobacter}	VGSLAGELSL LSALASRHL SABAELGR	.....
	HMGRclustalw{sulfolobus}	STVLGGELSL LAALSNGELG KAHAKDGRAM KV	.....
	HMGRclustalw{yeast2}	CAVALAGELSL CSALAAAGHLV QSEMTNHRK	.. TNKANELP
QPS	HMGRclustalw{yeast1}	CAVALAGELSL CALAAAGHLV QSEMTNHRKP	AEPTKPNND
ATDI	HMGRclustalw{phycomycetes}	.....	.....
	HMGRclustalw{fusarium}	AAVALAGELSL CSALAAAGHLV RAHQHNRSA	APSRSTTPGS
SHDARLTGHD	HMGRclustalw{candida}	SIVLGGELSL VSALAAAGHLV QSEMQHNRSA	AKK
	HMGRclustalw{dictyostez}	AAVLGGELSL MSALAAAGHLV RSHLKGNRKT	EAPAPQADTI
SMTHNLPHSD	HMGRclustalw{wheat1}	.....	.....
	HMGRclustalw{rice}	GSVAGRALT LAALASGHLV KSHMYNRSS	KDVAK
	HMGRclustalw{corn}	GGVALAGELSL LSALAAAGHLV KSHMKYNRSS	KDVSS
	HMGRclustalw{wheat3}	.....	.....
	HMGRclustalw{wheat2}	.....	.....
	HMGRclustalw{soybean}	GSVALAGELSL MSALAAAGHLV NSHMKYNRSS	KDVTK
	HMGRclustalw{rubbertree3}	GSVALAGELSL MSALAAAGHLV NSHMKYNRSA	KDVSK
	HMGRclustalw{rosypertwi}	GSVALAGELSL MSALAAAGHLV RSHMKYNRSS	KDITN
	HMGRclustalw{tomato}	GSVALAGELSL MSALSSGHLV NSHMKYNRST	KDVTK
	HMGRclustalw{woodtobacc}	GSVALAGELSL MSALSSAGHLV KSHMKYNRST	KDVTK
	HMGRclustalw{potato}	GSVALAGELSL MSALSSAGHLV KSHMKYNRSI	KDISK
	HMGRclustalw{radish}	GAVALAGELSL MSALAAAGHLV RSHMKYNRSS	RDISG
	HMGRclustalw{arabadopis1}	GAVALAGELSL MSALAAAGHLV RSHMKYNRSS	RDISG
	HMGRclustalw{cucumisamel}	GSVALAGELSL MSALAAAGHLV RSHMKYNRSS	RDVSK
	HMGRclustalw{rubbertree2}	GSVALAGELSL MSALAAAGHLV KSHMKYNRSS	KDVSK
	HMGRclustalw{rubbertree1}	GSVALAGELSL MSALAAAGHLV KSHMKYNRSS	KDMSK
	HMGRclustalw{camptothec}	GSVALAGELSL MSALAAAGHLV NSHMKYNRSN	KDVTK
	HMGRclustalw{arabadopis2}	GSVALAGELSL MSALAAAGHLV KSHMKYNRSS	RDIGP
	HMGRclustalw{chineseham}	GTVMAGELSL MAALAAAGHLV RSHMVHNRSK	INLQD

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FIG. 32RR

FIG. 32SS

HMGRclustalw{chinese2}	GTVMAGELSL MAALAAHGLV RSHMVHNRSK INLOD.....
HMGRclustalw{syrrianhamst}	GTVMAGELSL MAALAAHGLV RSHMVHNRSK INLOD.....
HMGRclustalw{rat}	GTVMAGELSL MAALAAHGLV RSHMVHNRSK INLOD.....
HMGRclustalw{rabbit}	GTVMAGELSL MAALAAHGLV KSHMHNRSK INLOD.....
HMGRclustalw{human}	GTVMAGELSL MAALAAHGLV KSHMHNRSK INLOD.....
HMGRclustalw{mouse}	GTVMAGELSL MAALAAHGLV RSHMVHNRSK INLOD.....
HMGRclustalw{xenopus}	STVMAGELSL MAALAAHGLV KSHMVHNRSK INLOD.....
HMGRclustalw{sea urchin}	ATVMAGELSL MSALAAHGLV KSHMKHNRSK LNIASPLPSI
DEVATHRSK	
HMGRclustalw{cockroach}	GTVLAGELSL MSALAAHGLV KSHMRHNRSK VSTSG.....
HMGRclustalw{drosophila}	ATVMAGELSL MAALVNSDLV KSHMRHNRSK IAVNSAN...
HMGRclustalw{dictyostel}	SAVMAGELSL MSALSAGHLM KSHLQVYNRK TN.....
.....	
HMGRclustalw{schistosom}	GTVLAELSL MAALDTDDLK KAHMHFNRAK QSTNSHSCSH
STTTDNDNI	
HMGRclustalw{archaeoglo}	..GLAQNFALALATEGID RGHMELHARN LAIMAGATGD
HMGRclustalw{pseudomonas}	..GLAQNLGA MRALATEGID RGHMALHARN IAVVAGARGD
EVDVVEIMV	
HMGRclustalw{EVDVVARQLV}	
Consensus	GTVLAGELSL MSALAAHGLV KSHMK-NRSS KDVSK-----



HMGRclustalw{methanobac}	.....	
HMGRclustalw{methanococ}	.....	
HMGRclustalw{halobacter}	.....	
HMGRclustalw{sulfolobus}	.....	
HMGRclustalw{yeast2}	.....	NKGPCKT SALT.	
HMGRclustalw{yeast1}	.....	NRLKDGSV TCIKS.	
HMGRclustalw{phycomyces}	.....	
HMGRclustalw{fusarium}	.....	QCPRALSVNN VDERRRYSFV KAIDE.	
HMGRclustalw{candida}	.....	
HMGRclustalw{dictyostez}	.....	
HMGRclustalw{wheat1}	.....	
HMGRclustalw{rice}	.....	A AS.	
HMGRclustalw{corn}	.....	T.	TATEK TRQREVDV.
HMGRclustalw{wheat3}	.....	
HMGRclustalw{wheat2}	.....	
HMGRclustalw{soybean}	.....	I S.	
HMGRclustalw{rubbertree3}	.....	I TF.	
HMGRclustalw{rosypertwi}	.....	I ASSQL ESDS.	
HMGRclustalw{tomato}	.....	A SS.	
HMGRclustalw{woodtobacc}	.....	A SS.	
HMGRclustalw{potato}	.....	
HMGRclustalw{radish}	.....	A TTTT.	
HMGRclustalw{arabadopis1}	.....	A TTTT TTT.	
HMGRclustalw{cucumismel}	.....	L ES.	
HMGRclustalw{rubbertree2}	.....	A AS.	
HMGRclustalw{rubbertree1}	.....	A AS.	
HMGRclustalw{camptothec}	A SS.	
HMGRclustalw{arabadop2}	S SQVNR	
HMGRclustalw{chineseham}		LOGTCTK KSA.

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FIG. 32TT

